

Audubon

A black and white photograph of a wet meadow. A stream flows through the center of the image, reflecting the sky and surrounding vegetation. On the left bank, a large, leafy tree stands prominently. In the background, a line of trees and rolling hills are visible under a cloudy sky. The overall scene is a peaceful, natural landscape.

JULY-AUGUST 1956

Magazine

FIFTY CENTS

PUBLISHED BY THE NATIONAL AUDUBON SOCIETY

AUGUST IN A WET MEADOW

(See Page 152)

WALTER H. SHACKLETON is a life associate of the American Ornithologists' Union, a member of the Wilson Ornithological Club, a life member of the Kentucky Ornithological Society and of the Beckham Bird Club of Louisville, a member of the Kentucky Society of Natural History, the Cooper, Georgia and Tennessee Ornithological Societies and the Carolina Bird Club. For the past five years, he has been engaged in lecturing for the National Audubon Society throughout the United States and Canada. He is president of Shackleton Productions, Inc., a firm supplying nature films for audio-visual use.

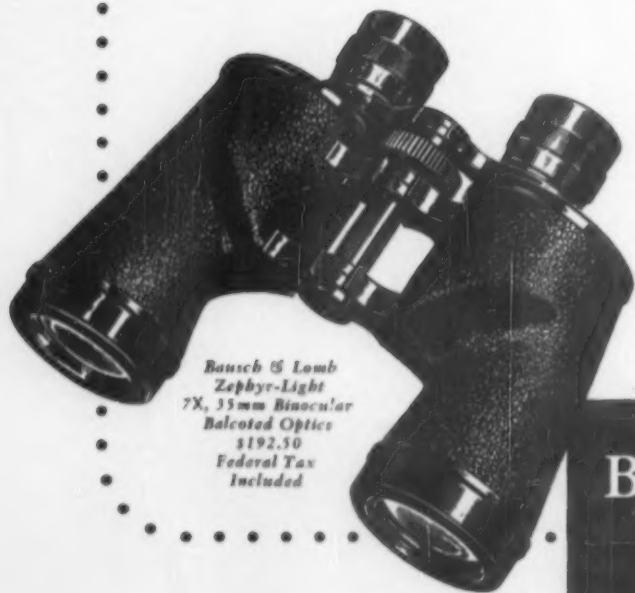


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Audubon magazine

Volume 58, Number 4, Formerly BIRD-LORE

PUBLISHED BY THE NATIONAL AUDUBON SOCIETY

A bimonthly devoted to the conservation of wildlife, plants, soil, and water

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Letters

One-Legged Chickadee

I was very much interested in Mr. Cornelius J. Ward's letter about one-legged birds in the March-April 1956 issue (p. 50) of *Audubon Magazine*. On March 5, 1956 the temperature was very warm (75 degrees) and I noticed that a chickadee was lying in our window box, trying to open a sunflower seed. I saw it the next day but in the next two weeks, during which time we had very cold weather with snow, I did not see it and thought it had perished. During the third week in March I saw it come again to the feeding box, and I saw that it had learned to balance itself on the one leg. It was at this time that I saw that one of its feet was off, with just the stub left. Since then I have chopped nuts on the box especially for it, and it has learned to open sunflower seeds. It uses its tail and wings for balancing. It seems to hold on to the sunflower seed with its bill until it can get it under its one foot.

It was still here in mid-May when our chickadees have usually left for the summer. It will be interesting to see how long it stays. It chatters a lot while it is on the box, and comes long after the other birds have left the feeder in the evening. We live on the edge of a small town and some of my friends in the town have telephoned to say it has been at their feeders also.

Mrs. James McGoldrick
New Augusta, Indiana

Unusual Mourning Dove Nesting Site

We have watched mourning doves about our place and have found them to be rather shy birds, always flying away at our approach. This is true even if they see us coming to a window inside of our house.

We were therefore much surprised this spring to find that a pair of mourning doves had nested on a pergola rafter above our front porch and over the top of the side steps where people walk right under them. We looked at them frequently but were careful not to watch too long or from too close a vantage point. The birds never showed any fright at our presence, merely keeping a wary eye upon us—though it is hard to tell just what a bird is looking at!

Then, just as the two young birds left the nest, and without our having seen any evidence of new nest building, we discovered that another pair of mourning doves had nested in a position

similar to the first pair but on the pergola just over the main flight of steps at the front door. This time we discovered them while one of the adults was sitting on the eggs. Again the incubating bird seemed not to care when we paused to look at it.

Isn't it rather unusual for these birds to nest so close to humans?

MRS. ESTHER M. FRITZ
Santa Barbara, California

We believe that is quite unusual for a pair of mourning doves to nest on a rafter. Usually they select the horizontal branch of a tree, often a pine tree, and close to the trunk. It seems that one requisite for a mourning dove nest site is usually a level support that will offer stability to the nest. I have never heard of them nesting so close to a house as Mrs. Fritz relates, although in Kansas, in the 1920's, an observer noticed that they preferred to nest in the vicinity of buildings rather than the wooded and secluded canyons of the back coun-

Turn to next Page

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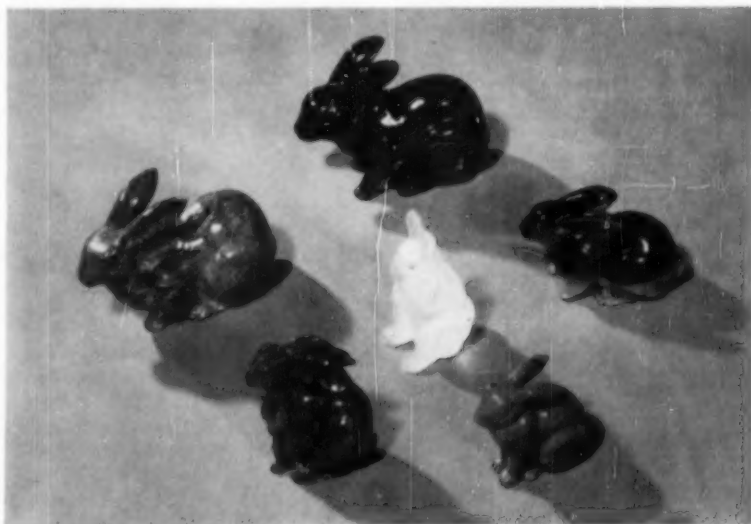
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try. We suspect that this was more than mere accident, and that something in the bird's nesting requirements influenced its choice of places that were close to human habitations.—J.K.T.

Help in Dove-Banding

In response to our note in the May-June issue, p. 139, about the urgent need for the banding of mourning doves to help in their protection and management, we have received letters, asking how one who doesn't have a bird-banding permit, may help, other than locating the nests of doves. The only suggestion we can offer is that you write to the U. S. Fish and Wildlife Service, Information Division, Washington 25, D. C., and ask them the names and addresses of people in your area who are permitted to band birds. If the Fish and Wildlife Service will supply this information, those of you who have located nests of mourning doves can then inform your local bird-bander and ask him to band the young birds. Perhaps some of our readers who are bird-banders may have some helpful suggestions.

—THE EDITOR

New Hosts at Bull's Island

Alexander Sprunt, Jr., has asked us to tell our readers that there are again quarters at Bull's Island, South Carolina, where visitors may get food and lodging. Those planning to stay there should write in advance to Mr. Walter Dawn, Bull's Island, Awensdaw, South Carolina.—The Editor

Reader Approval

I have enjoyed and saved every copy of *Audubon Magazine* since I first subscribed to it several years ago. The great work of education for conservation is of vital importance to everyone and I am sure we are all richer because of the efforts of the National Audubon Society. May it long continue.

Conrad Krogness
Greenwood, Wisconsin

Of Value to Science Teachers

I am glad that the nature of *Audubon Magazine* has been changed to include animals of general interest, other than birds. The illustrations are fine. For example, one could hardly miss identifying the upland plover, or upland sandpiper, after seeing the superb picture of it in the July-August 1953 issue. This bird is common here in meadows, but not numerous.

You can be sure that I follow *Audubon Magazine* closely. I am glad that you have made the material in it varied, for in this form it is of more value to the average science teacher than a magazine limited to birdlife alone.

F. A. HANAWALT
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THE MEANING OF WILDLIFE INVENTORIES

The inventory—as vital to wildlife management as it is to merchandising—became an asset in the field of wildlife resources when wildlife managers stopped thinking in terms of the total numbers of animals and set out to determine trends in populations, according to the U. S. Fish and Wildlife Service.

It was then, this agency points out, that the inventory ceased to be an item of curiosity, a measure of doubtful accuracy, and became a useful practice in wildlife management. It was then that the skeptic ceased to scoff, since the possibility of determining trends had a stronger appeal to human logic than any plan to determine wildlife numbers as such; it was then that a broad new field of measuring trends was opened; it was then that the habits of wildlife took on new meaning—the strutting of the male sage grouse became important to others than to the coy hens; the coo of the dove and the whistle of the quail told a new and definite story to the wildlife manager.

As a result of this development, no agency—state or federal—charged with the management of wildlife would think of attempting to function without a recent inventory—or a trend-study, as many call it, near at hand. Not only is the inventory one of the important tools in the management of waterfowl population in North America, but such things as quail inventories are necessary in fixing rules and regulations for quail hunting in many states; deer inventories are vital for deer management; pheasant inventories essential for pheasant work, and so on through the list of practically every species of wildlife in almost every state in the Union.

The rural postman, whose loyal and efficient services were invoked in the early days of estimating wildlife abundance, still plays his part in making roadside counts of wildlife. But from the crude and rather tenuous methods first used in "counting the ducks," government biologists have evolved a systematic scrutiny of the waterfowl breeding grounds in Alaska, Canada, and the United States, a project which calls for the coordinated efforts of more than 400 specialists, each performing an integral part of a carefully prepared task.

Just when the idea of taking a "census" of wildlife populations began no one seems to know, for the inventory is a development, not an invention, and it is still in an era of change. The wildlife inventory as it exists today is only

Continued on Page 151

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AN EDITORIAL— COVER ON THE LAND

IT MAY be a patch of weeds, or a marsh, or swamp, or even a bog. Perhaps it is a field of wheat or potatoes; or a stand of aspen, or maple. Whatever it may be, it is cover on the land. It is land's pleasant counterpane.

Land, we know, is our basic resource, our common denominator of all that is material. However high man may elevate himself on the stilts of modern living, he must at all times be aware that his props have their bottoms poked into the earth. Man cannot, must not forget this, ever.

Likewise, man must at all times consider cover on the land. Without this cover, be it swamp, maple, po-

tatoes or whatever, land is virtually worthless and so too, is man.

Cover on the land is abode to the pheasant, the cottontail, the fox, the coyote, the deer, the bear, the hawk, the robin. In a sense, it is fundamental to the existence of the bluegill, the pike, the bullhead, the rainbow, the muskie. Cover on the land is home to countless creatures, food to all that lives.

Down through the years man, on occasion, treated cover on the land with abuse and greed. Man was a loser in these conflicts. Dust storms, erosion, abandoned farms, denuded forests—these were results along with famine and poverty. No victories here, certainly, for man or land.

It was not until man learned to treat land's cover with respect and consideration that optimism became associated with the land-man relationship. We have that optimism now. It is reflected in soil conservation practices, in a return of the forest, in sound management of vast areas of game cover, in the protection of water resources, in the progress of agriculture. In short, we see it more often than ever before in the wise use of cover on the land.

In this wise use there can be no relaxing of man's respect for and consideration of land and its cover. A constant awareness of his total subservience is essential if he is to enjoy life, or rather, if he is to exist.

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THE MEANING OF WILDLIFE INVENTORIES

Continued from Page 149

two decades old or less. The winter waterfowl survey, which is an annual inventory made by the U. S. Fish and Wildlife Service, began in 1935, and took the place of more or less desultory observations on waterfowl made prior to that time. Other federal agencies dealing with lands probably made wildlife counts from time to time on specific areas but these were usually for the benefit of the land and not for wildlife. Many of the states had made some sort of inventories but, generally speaking, these were estimates rather than inventories, or systematic trend-studies.

U. S. Fish and Wildlife Service officials say that it was the Federal Aid program which gave the states both the money and the inspiration necessary to begin work on methods of determining trends in wildlife populations. As one state developed a technique, other states picked it up and often improved on the original development. While each of the 48 states was devising ways and means of meeting its own problems of wildlife inventories, the U. S. Fish and Wildlife Service was busy coordinating their efforts and developing other methods in its own field of migratory waterfowl management. As the techniques improved, the inventory became more and more valuable in wildlife management, and as it became more valuable, more effort was expended on improving the methods of measuring population trends. At present it may be said that inventory methods have been somewhat standardized but not stabilized. Better ways are being sought, and as they are found, they are used.

In practically every animal, some peculiarity or idiosyncrasy in its makeup, or habits, plays a part in the methods used for its inventory. For example, it was noted that a pheasant is wont to seek dry spots near roads, making an early morning inventory over properly selected roadways a good and practical way to compare one year's population with the population of earlier years. Research also showed that the mourning dove almost invariably does its calling, or its singing, in the early hours of the day, just before and just after sunrise. Hence, the "call-count" along certain routes gives a year to year comparison of the dove population in an area. A count of the male sage grouse or prairie chickens on the booming grounds, where these birds are strutting in sight of the concealed hens, gives a good indication of the number of male birds in a given area. Knowing the ratio of hens to males from earlier counts, the wildlife manager gets a comparative count of them. And so with the sharp-tailed grouse on its dancing grounds,

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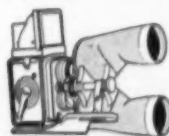


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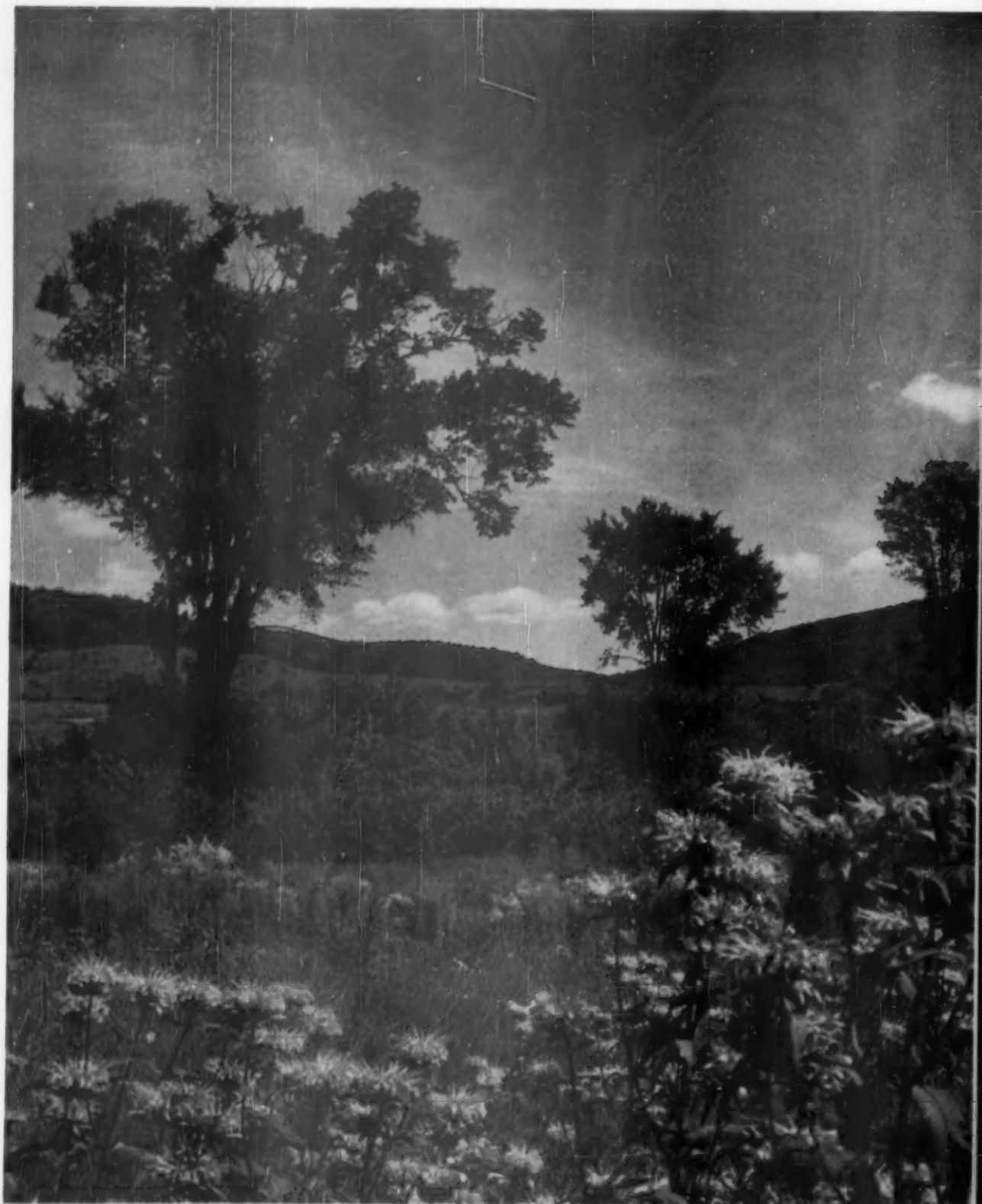
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August in a

"Many of the open meadows, for years, have known neither scythe nor mowing machine."



Wet Meadow

All photographs by the author.

By Samuel H. Gottscho

IN a secluded valley of the Adirondack country of New York State, a stream called Mill Brook, lazily wends its way through the lush meadowland to finally empty into Schroon Lake. Every successive spring its freshets flood the adjacent low parts of the meadows which remain quite moist all summer.

For nearly 30 years I have known and loved Mill Brook. Every August I have meandered with it through this sparsely-settled valley, where hardly ever more than six families

have lived along its five-mile course. Many of the open meadows that line its banks have known neither scythe nor mowing machine for many years. A few cows at times have grazed there and in bygone years, long before my time, some farming had been done in the valley, but now most of the pastureland and meadows have reverted to a wild state.

During the first years of my acquaintance with Mill Brook, I studied every twist and turn with a photographic eye looking for compositions that would be satisfying as pictures. Later, when I became an



"At the edge of the brook grows arrow-head."

"Some farming had been done in the valley but the meadows have reverted to a wild state."



ardent lover of wildflowers, my happy hunting grounds were along and near the banks—the wet meadows as I call them. There I have found some of the loveliest and choicest of wildflowers, all of which became subjects for my color camera and form part of my present large

collection of photographs of wildflowers of many species.

There was one section in this valley that I particularly favored and frequented almost every afternoon during my August stay. My wife would be parked under the shade of a glorious sugar maple, with her

books and sewing, while I rambled all over the neighborhood, returning occasionally with reports of my finds and successful pictures.

I love to recall some of these warm, sunny afternoons there. White clouds—beautiful as they are in that country, which we call the “cloud

“The blue eyes of the fringed gentian will open—the last flower of the year.”





"The white flowers of boneset . . ."



"turtleheads . . ."



"...and purple-fringed orchis . . ."

factory"—floated lazily in the deep blue sky above and cast their shadows on nearby Park Mountain and the distant hilly landscape. Tranquillity and beauty enveloped this idyllic spot, where every prospect was so pleasing and where absolute

quiet reigned, scarcely broken by the insect chorus which would reach its peak later. Even a bird voice was a rarity, for it was August and they were molting and moping in the deep woods.

Most prominent of the August

wildflowers here is the tall and stately Joe-Pyeweed, *Eupatorium purpureum*, with its old rose- or raspberry-colored flower heads. It dominates the meadow, in large colonies, its stalks sometimes seven feet high. I have often noticed monarch and

Continued on Page 190

"The pink-white flowers of meadow-sweet . . ."



"and the tall and stately Joe-Pyeweed."



How do young coots and Franklin's gulls behave at birth? What was the significance of their attachment to their human foster-parents? An observer gives us a glimpse into



A Young Bird's World

By Constance Nice*

MY MOTHER, Margaret Morse Nice, had for many years studied the behavior of birds in the field, notably song sparrows at Columbus, Ohio. Through her reading of the world literature on bird behavior, she learned of the pioneer studies of Dr. Konrad Lorenz of Altenberg, Austria. She spent the summer of 1938 at Altenberg, learning to raise altricial baby birds, and what to watch for in the development of their instinctive behavior; their preening, stretching, gaping, cowering, etc.; as it developed day by day.

Dr. Lorenz has studied especially the instinctive behavior of ducks and geese, jackdaws, fish, and dogs, as described in his delightful books, "King Solomon's Ring" and "Man Meets Dog."

Dr. Niko Tinbergen of Holland, who studied the herring gull for more than 20 years, studied with Dr. Lorenz in 1937. His book, "The Herring Gull's World," is a fascinating explanation of their way of life. He has also intensively studied fish and insects and has written some very learned works on this new science of animal behavior, or ethology, notably, "Social Behavior in Animals" and "The Study of Instinct."

From their studies of animals under natural conditions, and from

laboratory experiments, these specialists in animal behavior discovered that animals coordinate their behavior through a system of signals, each of which releases an instinctive response in either its mate or rival. The response of the mate, in turn, serves as a signal to set off the next instinctive act in the first animal that originated the series and so on, so that the mating behavior, for example, of fishes and birds, is carried through to a successful conclusion.

We can learn much from the study of bird behavior that is suggestive as to human behavior, because in many ways birds behave more like people than do most other animals. They, too, depend primarily on sight and hearing, and many have family lives in which both parents share the responsibilities of raising the youngsters.

Living in Chicago, my mother and I became very homesick for the outdoors. When Albert Hochbaum offered us fellowships to study the developmental behavior of baby marsh birds at the Delta Waterfowl Research Station he directs at Delta, Manitoba, we jumped at the chance. We arrived at Delta, which nestles on the dunes between Lake Manitoba and the marshes and bays to the south, in June 1951 after a trip on which we had admired the ducks and grebes nesting in the prairie pot-holes along the roads of the Dakotas. We had not previously raised baby marsh birds, and had no ideas as to which species would respond most successfully.

Peter Ward, the second generation of Wards to head the Delta Waterfowl hatchery, offered his cooperation in having marsh bird eggs hatched with the many species of duck eggs. He has been making a study of American coots, which are really a species of rail that has become adapted to a swimming or water life. He was eager to observe the behavior of healthy, incubator-hatched coots, but they had not thrived when raised by the impersonal methods successful with ducklings. Our requests to the wildlife management students at Delta for marsh bird eggs brought us eggs of Franklin's gulls, and coots.

A hatching bird always faces the large end of the egg and the chipping of the shell in a circle by the hard egg tooth on the tip of its bill is caused by its efforts to lift its head. The process starts hours before the infant, wet, tired, and reptilian-looking, finally manages to push off the lid it has cut in the shell, struggles out, and kicks it away. Then it immediately tries to crawl under something warm, and at the end of an hour and a half, or two hours, is a fluffy handsome little bird.

But our little coots were bald after they had hatched, except for two tiny parallel lines of down from front to back of heads that were red from the blood showing through. They had bright red bills, orange ruffs around their necks, and orange tips to their black down. Altogether they were the most comic-looking baby rails we had ever seen.

* Editor's Note: The author, Constance Nice, is the daughter of Margaret Morse Nice whose studies of song sparrows are known to ornithologists throughout the world. Her "Studies in the Life History of the Song Sparrow," Parts I and II, were published by the Linnaean Society of New York City in 1937, and in 1943, respectively. —The Editor

Very shortly they began to beg for food, weaving their heads back and forth snakily and waving their tiny wings. Ducklings can wait 24 hours without eating, until their mother can take the whole brood off the nest together, but as little coots hatch and leave the nest one by one, they are taken over by one parent, while the other continues to sit on the hatching eggs. Although the baby coots actually took only token feedings of chick mash the first few times, compared to ducklings, they ate surprisingly soon. One ate only 25 minutes after hatching.

Our podgy little coots were very enterprising. They were continually exploring the table top, even though they fell off the edge, which did not seem to hurt or alarm them at all. Apparently the hazard of falling is something that a normally-raised coot does not develop any inherited precaution against.

Although the temperature of the incubation room seemed very high to us, it evidently was not quite warm enough for the little birds. As Mother said, "They are the loveliest little things," for they continually tried to cuddle against our forearms or hands, making it impossible for us to write our notes. Although adult coots are fiercely territorial, our tiny ones accepted all their strange nest-fellows—baby Forster's terns, Franklin's gulls, and several species of grebes and ducklings. However, when the first western grebes died and a new one hatched two or three days later, the six-day-old coots immediately treated it as a stranger. They pecked it severely, and even ran after it. When we picked it up to rescue it from such rough treatment, they jumped into the air to peck it again. Nevertheless, after the little western grebe had been placed with them several times, they cuddled up to it.

The little coots had a variety of conversational notes. They called in a sweet high little "weep, weep weep," when contented and in close contact with their family. They called in a louder tone as they became more excited, till they reached a call much like a robin's distant scolding. This was the call they gave if they were lost or hungry or apparently unhappy for some reason which we could not guess.

The Franklin's gull eggs we had

taken from one of their populous colonies in the shallow water of a bulrush island at the eastern end of the marsh. These gulls belong to one of the species of medium-sized black-headed gulls, and are closely related to the laughing gulls of the eastern United States.

Nearly every broad, flat, floating nest built of rushes by the adult Franklin's gulls, contained either two or three mottled eggs or fluffy grayish and brownish recently-hatched chicks. Warned by the uproar of the infuriated parents, the chicks would promptly start to paddle away in the waters of the marsh.

When our eggs of Franklin's gulls began to hatch, the chicks soon dried into cunning balls of down with little, pink, webbed feet. Even at that early age, they already had a faint call that resembled their parents' loud shrieks. They ate as readily as the coots and also explored, but more deliberately, so that they never fell off the table edge. They were often annoyed by the passion of the baby western grebes for looping their long necks over the backs of their necks, and pinning their bills to the ground. After a long and successful struggle to free its head, a baby gull so held by a grebe would squawk indignantly for some time. One of the gulls' amusements was trying to fly. At the age of two days, they started running, leaping a half inch into the air, waving their tiny downy wings, and shrieking.

We could not bear to leave all of our little birds behind at Delta when we had to return home to Chicago. But we did not realize how large, and how noisy our gulls soon would be. Encouraged by Al Hochbaum, we picked out the two youngest and quietest of each species—the coots

"The little coots had a variety of conversational notes."



four and five days old and the gulls three and five days old—and put them in a cardboard carton, complete with air-holes and removable wire bottom. We also furnished them with a small vacuum bottle of ground rabbit meat and some turkey-starter, and then began our journey. One of us easily fed them in the box about every two hours, while the other drove. We arrived home in Chicago without incident, except one night when we had to dig out the heating pad at 1:00 a.m., because the youngsters had been continually trying to crawl under each other for warmth.

Our little birds seemed delighted to escape from the confines of their traveling box, but they were soon telling us loudly that they considered their three-foot long by four-foot wide cage on the sunporch too small and too dull. My mother and I found it necessary to baby-sit with them in our backyard, which was enclosed on two sides by a fence and a large garage, but open to possible wandering cats and dogs on the other two sides. We took turns out there watching, reading, writing, and studying. The little birds loved the backyard—always there seemed to be something new and interesting for them to do. They preened and dozed and chased flies—without catching them—and ate gravel. They did not seem to get hungry so frequently when they were outdoors. They may have caught insects too tiny for us to see, and the coots certainly ate some vegetation and the dirt out of ant-hills. Once when I had left out some defrosted horse meat covered with newspapers, the coots carefully picked off the tiny ants and ate them first as a special treat before they ate the meat. All four soon discovered the source of the choice mulberries I was bringing them—the area under a mulberry tree in our yard. They helped themselves to berries in all stages of ripeness with no ill effects.

The coots were devoted to the gulls, and considered them one set of parents. They would be foraging peacefully at one edge of the garden—suddenly it was imperative that they be with their beloved gulls instantly. (Pete Ward at Delta had told us that, "coots do everything on impulse.") They would dash down the lawn, bobbing their heads, wav-

ing their tiny wings and lurching as they threw out their big feet from side to side, and fling themselves to the ground before the gulls and weave their heads back and forth begging.

In nature baby coots receive most of their food from their parents' bills; parental feeding is doubtless stimulated by the bright coloring and elaborate posturing of the chick. Perhaps the chick that begs most intensely has an advantage over less demonstrative brood-mates. We found a marked difference in little coots in their readiness to beg. Our hand-raised birds got most of their food at first from our forceps and later from a dish; their begging energy was not used in normal fashion. Perhaps it accumulated, and so was ready to be set off by inadequate stimuli. Once our two birds started begging of the gulls, they seemed to have continued it through habit, even though their begging was never rewarded by food. Occasionally they did pick food from the edges of the gulls' bills when all four were fed by us at the same time. Perhaps their begging of the gulls became a symbol, a kind of greeting ceremony.

Sometimes the gulls bowed and shrieked at the coots in return. This, too, seemed to be a kind of greeting ceremony to any member of our human family, and it did not matter whether or not the gulls were hungry or had ever been fed by the particular person they were calling to.

Young birds do not hatch with a clearly defined picture of their particular parent. Some, like young geese, will accept as their parent the first moving object they see; they may become firmly attached to the human caretaker. We had become the parents to our baby birds, but a young bird, raised in captivity from birth, may not respond to its "parent-companion" as a whole, for in captivity a chick may accept one object for its "warmth-companion" and other objects for other parental qualities. Our coots treated us as "guiding-companions," and the gulls as "guiding and feeding-companions."

The coots would sometimes run wailing to the one of us that came from the kitchen, explaining to us how hungry they were, but they did not beg from us after the first

few days. However, in 1952, two coots begged from my mother up to the time they were 19 and 22 days old, and they also begged from young gull companions up to the time they were 19 days old.

When we picked up the gulls to take them into the house at supper-time, they shrieked loudly. They never liked to be picked up, because in nature only a predator would do so and this was their instinctive protest against it. When the gulls yelled, the coots would rush under the sun-porch windows crying to their dear friends. We could not see that the gulls made any special effort to stay near the coots, but they never pecked or in any way mistreated their smaller companions.

When our coots and gulls were about three weeks old, my Mother and I took them on a visit to Jackson Park in Chicago, to the astonishment of people, some of whom said; "I never saw birds like these in the park before." In the park the coots rushed to Mother for protection, when they saw a white pigeon fly over. Evidently they had mistaken it for a hawk, which they feared instinctively. In general, our birds seemed to prefer to be near bushes to being in the open and had a pleasant time eating mulberries they found on the ground, and the earthworms and sowbugs we found for them by lifting up stones.

By this time the gay colors of the young coots had disappeared in their growing expanse of black down. This was gradually replaced by gray feathers above and whitish ones below. They now were trim, pleasant-looking birds resembling small emus, with a seam of black down still

showing down the center of the front. Their growth had seemed to run all to their legs and feet, which were enormous, but not to their wings, which did not start to feather out till they were 30 and 31 days old.

The gulls had also got most of their feathers and had begun to resemble their parents, except for lighter-colored heads and the down still around their necks, which made them look as if they were wearing fox-fur collars. They had enormous appetites and they grew faster than the coots. They reached their maximum weight when they were about 24 and 25 days old.

Since our coots had not been introduced at an early age to sufficient water for bathing, they bathed *beside* the basin for several days before taking a real bath in it. However, when rain left a puddle in our gravel road a few days later, all the birds were delighted. They took elaborate baths in the muddy water, emerging immaculate after preening. The coots in particular loved paddling around in the mud and eating it, but my sister hoped the puddle would stay dry because her three-year-old enjoyed it almost as much as the coots did, and *didn't* preen himself clean. I refilled the puddle, however, for their amusement.

Both gulls were always fond of us but when Little Gull—two days younger than the male—reached the age of four weeks, she began to resent more and more trespassers (people who did not feed her). She particularly disliked people who wore red shoes or blue jeans. She would put down her head, swell up her throat, hold her wings out at the

"A baby gull, held by a grebe, would squawk indignantly..."





"The young gulls never fell off the table as the young coots did..."

sides, and shriek. If the person continued to approach, she would attack the feet and legs with furious pecks. This was amusing if the victim wore long pants, but rather uncomfortable if he did not. I decided she attacked only boys, because they walked right up to her, while girls kept at a polite distance. This was normal, or natural behavior, because in the wild, gull-chicks try to drive adult intruders from the family territory.

Each day our gulls worked hard on their flying. The day came when their efforts lifted them off the ground for one step. By July 26 at the age of 30 days, Big Gull, the elder of the two, was flying 20 or 30 feet at three or four inches above the ground, then soaring up to nine feet high over the neighbors' grounds. Three days later the two gulls were flying well. At first flying seemed to be a sport with them rather than a method of getting somewhere in particular. When Big Gull landed in the neighboring garden, he could think of no way to get home but would shriek and look for a hole in the fence. The same thing happened when he landed, accidentally, two gardens in the other direction. But two days later, when he lit on our garage roof, he flew down to the ground again as I was preparing to go after him.

On the 30th of July both gulls were soaring over the roof tops, and, after a search by all the neighbor-

hood children, Big Gull was captured running down the street. Fearing that the gulls' explorations might lead them to being struck by a car or a train, and that the coots might get lost looking for them, we took all four birds next day to Brookfield Zoo in Chicago Zoological Park, Brookfield, Illinois. There the coots seemed contented in a pen with some young shorebirds. Big Gull gets on well in the big flying cage, and Little Gull is great friends with a Bonaparte's gull in the sun parlor.

In the Old World much work has been done on the pecking responses of baby gulls, on the behavior of adult gulls, and the activities of baby coots have been studied in nature. In the United States, Gordon Gullion has published in the *Auk* and in other ornithological journals fine studies on coots in the wild. No one, however, had concentrated on watching the day-to-day development of hand-raised coots and gulls.

The purpose of our studies was to watch the appearance of the innate coordinations in different kinds of precocial birds. In our four years' work we have found an orderly se-

quence in the maturing of these instinctive coordinations that shows a general similarity from species to species. At first the baby birds perfects his locomotor abilities and starts the care of his plumage. He next discovers how to eat, and becomes ready to "freeze" or to run away when danger threatens. When about a week old he is ready to attack a strange chick about his size or smaller. Later he perfects his bathing technique, becomes more and more independent, and finally starts to fly. These are the broad outlines, filled out by many other activities common to all and by special activities peculiar to each species or each group of species.

We have watched many baby coots and Franklin's gulls, but never again did we have the opportunity to follow them as long as we did in 1951. That summer gave us our only information on the later development in these two species. Although their care was time-consuming and the gulls' voices were loud and raucous, in return these four birds furnished us important scientific data, and a lot of fun.

—THE END.

WHOOPING CRANES ON THEIR NESTING GROUNDS

Three whooping cranes, one of them already on the nest, were sighted May 16, 1956 by Ed Wellein, pilot-biologist for the U. S. Fish and Wildlife Service, according to Director John L. Farley. The pilot-biologist, who was engaged in the 1956 waterfowl breeding ground survey, said that the cranes were about 50 miles west of Ft. Smith, which is on the border between Alberta and Northwest Territory in Canada. Mr. Wellein declared that one of the birds was occupying a nest which was sighted last year.

Eight of the 27 whooping cranes began their northern flight from their wintering grounds on the Aransas National Wildlife Refuge in Texas sometime between March 25 and April 6. The other 19 left the refuge sometime after April 6. On May 4 a flock of 20 whooping cranes was seen over Delta, Manitoba, not far from Winnipeg, the Canadian Wildlife Service reports. They were flying low, about 150 yards above the ground, and making good headway against a 30-mile-an-hour wind. The cranes were observed by Miss Helen Hayes, a graduate student in ornithology at Cornell University who has spent several seasons in Manitoba on waterfowl observations. She reported that the birds passed directly overhead and that they were in sight for four minutes.

Apparently there are only 27 wild whooping cranes still in existence. Twenty-one cranes went north a year ago and 20 adults and eight young came back in the fall. One adult was missing. During the winter another adult disappeared. The brood of eight in 1955 is the largest number of progeny noted since the first official count was made in 1938-1939. In 1941-1942 there were only 15; in 1949-1950 there were a total of 34 whooping cranes.—THE EDITOR

How to care for *SNAKES*

By Edwin A. Mason

THE unknown and the imperfectly understood—these are the things which cause uneasiness in the mind—whether it is the darkness, or whether it is snakes. Snakes frighten some people, but snakes fascinate almost everyone. Adults, especially, seem frightened of snakes—the ladies perhaps more so than anyone else, but even big, burly men have been seen to shudder and move away at the sight of a common, harmless snake.

Generally speaking, children aren't afraid of snakes. Some of them become scared of reptiles because they have seen their parents or other adults act frightened when they have seen snakes in the garden. Children usually like snakes, and can easily be induced to make pets of them. This is a good interest for youngsters, provided the snakes are properly housed and adequately taken care of. If a snake pet is properly housed, the child's mother is going to be happier. If she knows the snake is in a cage that is suitable, which will also ensure that the creature stays put, she is much more likely to agree to a pet snake around the house.

Snakes kept in captivity have considerable value in teaching youngsters the role of snakes in the environment, their value as eaters of insects and controllers of other animals. Some snakes eat mice, some eat rats and gophers, but whatever their diet, snakes have a definite place among those creatures which tend to regulate and keep in balance the animal populations of a given environment. Obviously, if youngsters are going to keep snakes as pets, they must look after them properly, keep their cages clean, feed them regularly and adequately, and see to it that they have a constant supply of clean water. They are thus going to learn by doing how to properly care for pets. Also, a familiarity with snakes should help them to become

more appreciative of all living things.

With snakes alive in the house, even the adults will learn from the children. They will learn not to be afraid of snakes; they will learn that they are not slimy as so many people often think; they will learn in time to look upon them as graceful, beautiful animals, enacting a role in nature, and, as such, creatures which should receive the care and protection of all those interested in the conservation of our natural resources.

Snakes have been used widely for demonstration by teachers in biology and conservation. We often see them on display at trailside museums, wildlife sanctuaries, children's museums, and state parks, sometimes presented inadequately, sometimes in showcases which exhibit the snakes so that their grace and beauty can be appreciated.

A good snake cage requires that the animal have an adequate amount of air; it should also be roomy enough so that the snake can move around, stretch its long body, and get the kinks out of that tremendously long backbone it has. A rule of thumb would be that the cage should be as long as two-thirds the length of the snake. The cage shown in the illustration with this article is the result of many trials with designs which would satisfy the requirements

of proper housing, while exhibiting the snake in such a way that it could be readily observed. The basic structure is built of wood—it could be scrap lumber if a boy wanted to build his own. The sides are made of pieces slightly over an inch thick, so they will not warp. They are cut so they slope to the rear at about a 60-degree angle. Some expert help may be needed to saw the groove on the insides of the end-pieces, where the glass cover will slide. A wood-working hobbyist with a power-saw can easily make such a groove, which has to be wide enough for double-thick window glass. The cage has a wooden floor, a strip of wood across the front, another across the back extending about half-way up. The door forms the upper part of the back. This is hinged so that it falls to the rear. This allows the cage to be easily cleaned, the animal easily fed and watered, and simplifies removing the snake for the petting and handling necessary to make it tame. The door is a simple thing, made with strips of wood and screen wire. A piece of bronze or copper wire screen is sandwiched between the two strips of wood on all four sides, so that no rough edges are present. The door ventilates the cage, allowing plenty of air circulation. It is placed high in the cage in order that the normal

Snake cage recommended by the author. Photograph by Walter Sibley.





"Snakes fascinate almost everyone. Usually, children are not afraid of snakes." Photograph by Don Wooldridge.

meanderings of the snake around the cage do not bring its nose in contact with the wire. The door is latched at both ends. A hasp can fasten one side if necessary, with a padlock locked on.

This cage is designed for harmless snakes. It is not designed for the poisonous ones. The glass used is double-thick window glass, obtainable at any hardware store. To house poisonous snakes, it would be necessary to use safety glass, or glass that

has been re-enforced with wire.

To finish the job, paint the cage. On the outside, this can be any color; for the inside, use aluminum paint. This will reflect sufficient light to make the colors of the snake show up well, without having the glare and easy-soiling qualities of white paint. The result is a good-looking exhibit cage, which is also safe and sanitary for the pet snake.

You will notice in the picture that there is an old, rough, picturesque

piece of wood in the cage. This is for a purpose, as well as to look well. The purpose is to make available rough places, on which the snake can rub itself when it comes time to molt its skin. Reptiles need larger skins as they become bigger. To accomplish the change from the old to the new, they literally turn their skins inside out. This can often be watched when snakes are kept as pets, and is always fascinating to see. The new skin is formed beneath the

old, and when the change is complete, there is the pet with a new, brightly-colored skin, and more handsome than ever.

There should be some litter in the bottom of the snake cage. First a little clean sand, and then a few pine needles or some old leaves from the forest floor. The sand will help when

it comes time to clean the cage, and the leaf litter will provide a light cover, under which the pet can partially hide.

It should be remembered that constant feeding with resultant constant growth, are natural in the snake world during the warm season of the year. Snakes also have to store within

their bodies food to carry them through the winter hibernation. Thus you have the job of providing the snake with a steady supply of such foods as frogs and worms. If these natural foods are not available, you can often get a snake to feed on strips of raw fish or on raw, lean hamburger. This is best rolled



NATURE IN THE

Reprinted from the New York Times, May 26, 1956

Frost Blights Crops in Northeast

Damage in Millions — Cold Birds Join City Breadlines

A late spring frost, with temperatures dropping twenty degrees to record lows in many areas, inflicted damage estimated in the millions to crops throughout the Northeast yesterday. . . . The frost also brought scarlet tanagers to the city. Experts at the New York Zoological Society decided the colorful birds were here seeking food. Cold weather has kept their usual diet of insects from developing.

The zoo officials suggested that tanager fanciers feed the birds bread crumbs and raisins. Some loungers at City Hall Park yesterday had bread crumbs for them.

The scarlet and black birds customarily migrate from Central America to the eastern part of the United States at this time of year.

The frost was produced by a mass of cold air that moved from the Polar regions over Canada and down to the Middle Atlantic states. The air mass . . . penetrated almost to the Gulf of Mexico. . . .



The New York Times (by Neal Boenzi)

Scarlet tanager eating bread in City Hall Park, New York City.

SCARLET TANAGERS IN TROUBLE

We can not remember when Audubon House has received the number of calls about scarlet tanagers that we have had this spring. Practically all of the anxious people who have telephoned us from the New York City area, Long Island, New Jersey, and Connecticut, have reported that the tanagers were feeding on or close to the ground. Some of them were so feeble that they could be approached and picked up. In New York City, migrating scarlet tanagers, much weakened, were found inside of apartment houses and department stores, and on the window ledges of office buildings. One observer, while driving between Sheffield, Massachusetts and Rutland, Vermont, on Route 7, saw at least 25 scarlet tanagers sitting along the roadside, or lying there, where some of them had been struck by cars. One of the dead tanagers had in its gizzard only a few insect legs and some fragments of snail shells. Apparently the tanagers had been attracted to insects on or near the highway, for most observers agreed that the birds seemed to

be starving. People who attract birds have noted that the tanagers ate the bread that they put out for them as if they were famished. One woman reported that a wave of migrating tanagers ate several pounds of chopped suet from her bird-feeding tray almost as fast as she could supply it.

Entomologists have reported that, locally, in the Northeast, the population of the spring canker worm, *Paleacrita vernata*, has been very low. This is a smooth green caterpillar, called a geometrid, or measuring worm, which is much fed upon by small birds, especially by warblers and vireos. Although we have no absolute proof that a scarcity of insects has affected the scarlet tanagers (they may be afflicted with some exhausting or killing disease), the wet, cool spring in the Northeast has delayed the leafing out of many trees and shrubs. Many of the eggs of insects may have hatched prematurely, and the lack of leaves on the host trees or the cool weather may have killed the larvae. There seems to be rather good observa-

tional evidence that there were fewer insects available for small birds this spring. Bird-watchers noted that warblers and vireos, which ordinarily feed well up in trees, fed low in the branches, and often descended to the ground and to open lawns to feed.

Insects that scarlet tanagers usually eat are wasps, bees, ants, beetles, bugs, caterpillars, and moths. With a scarcity of natural insect foods, they also will eat fruit put out for them—blackberries, grapes, cherries, bananas, and halved oranges. Although the emergency may be over by the time this note reaches our readers we urge that you put out chopped suet, bread, and fruits for insectivorous birds that seem to be weakened or suffering from a shortage of their usual insect food supply.—J. K. T.

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DEATH OF A RARE BIRD

Reprinted from The Philadelphia Inquirer
April 11, 1956

Reports from North Carolina that a number of ivory-billed woodpeckers have been sighted, while one has been found that had been shot, remind us again that, no matter how rare or near extinction a species may be, there always seem to be some human beings who will prey upon it.

The ivory-billed woodpecker, called the "king of the woodpeckers," is the most spectacular member of its family, but is considered to be virtually extinct except in the deep swamp forests of Florida and Louisiana. It is set off from the pileated (crested) woodpecker by its larger size and its white bill, but gunners might mistake it for the more common type. That, perhaps, is the excuse for the wanton killing of the North Carolina bird, and it is not a good one.

The truth seems to be that only great effort by the National Audubon Society and other wildlife organizations can prevent a substantial

around the end of a piece of string, or fed to the snake from the end of a thin stick. Fresh water in a low bowl should be in the cage at all times.

Another important thing to remember is that a snake cannot live if kept in full sunlight for long periods of time. Snakes have no way of

controlling the temperature of their blood stream the way mammals do. Their body temperature is always near that of the air temperature. That is why they are more active when it is warm, and sluggish when it is cold. As a general rule, snake cages should be kept in a shady place, or where the sun shines only for

a brief period during the day.

A good practice for most people would be to have a snake for a pet only for a short period of time. Then, when a new one is found, release the one you have had for a while, and keep the new one. Also, inasmuch as snakes are easily found, the thing for most people to do is to release their pet snakes in the late summer or early fall, and just put the snake cage away until the following spring. This is usually much better than trying to keep a snake in captivity over winter.

Which snake makes the best pet? There is no hard and fast rule, but the thing to remember is that it must be one of the harmless ones. Usually it is one that is common. The garter snake fills the bill for practically the entire United States; also the garter snake feeds well in captivity on either worms or frogs. Hence the garter snake is about an ideal snake for a pet. Ribbon snakes are all right, too, also the small red-bellied, ring-necked, and DeKay's, or brown snake. The black snake and milk snakes are handsome non-poisonous ones, but the blacks are apt to be of large size, and the milk snakes, the great mousers, usually will not eat in captivity.

Now a word of caution about the snakes to stay clear of. Rattlesnakes, wherever they are found, are obviously not animals to make pets of. In the South are the dangerous water moccasins, or cottonmouths, and the beautifully-colored coral or harlequin snakes. While usually nocturnal, the copperhead is another snake to treat with respect. The snakes just mentioned are all poisonous and capable of injecting a dangerous dose of toxin by biting with their needle-like fangs.

The common water snakes, with a range which covers the entire eastern half of the country, are relatives of the garter snakes. As their name implies, they are found near bodies of water. While not poisonous, they are more vicious than most snakes, and can inflict wounds which sometimes become infected. Besides being wild in nature, they usually defecate when disturbed, and so add a bad odor to their other bad attributes. In general, then, it could be said that the small, common, harmless snakes found around the garden are the ones most likely to make the best pets.

—THE END

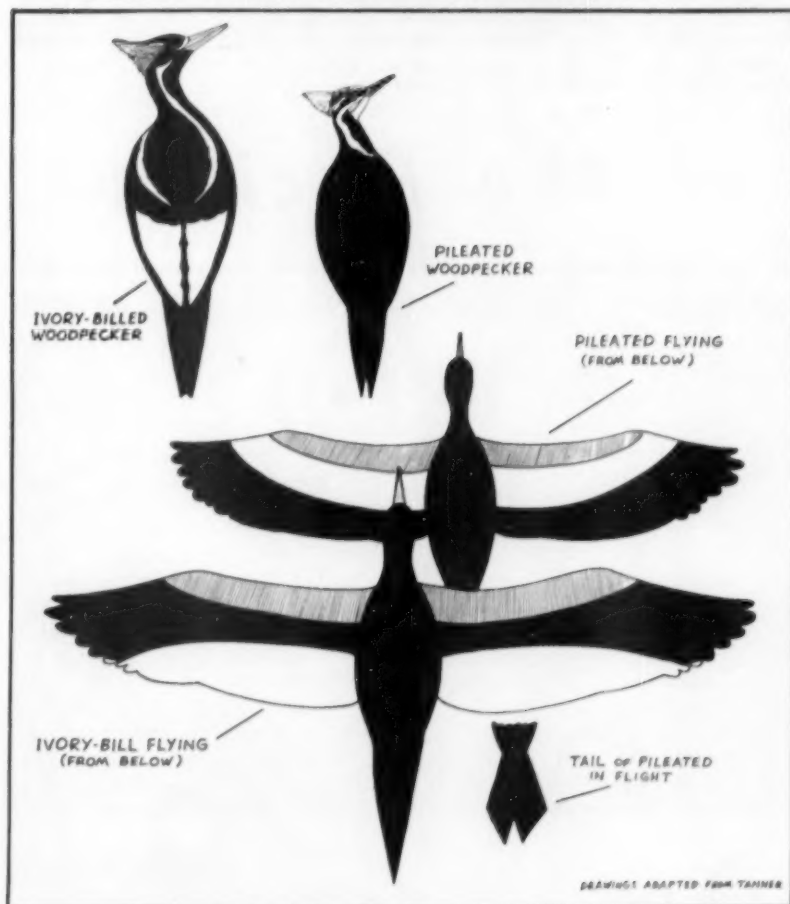
E N E W S ★ ★ ★

group of nearly extinct birds and other animals from being wiped out in this manner. Even the great whooping cranes are shot at and killed during their migrations, while less-publicized remnants of once-plentiful forms of wildlife suffer annual depredations.

It would be a fine thing if the thoughtless shooting of living creatures could be curtailed. Our American wildlife is a heritage that should be passed on to our children intact and augmented, if possible, not with its most typical members missing forever.

Can You tell a Pileated Woodpecker from an Ivory-bill?

Some people have been reporting that they have seen the rare ivory-billed woodpecker, which, upon investigation, proved to be the common pileated woodpecker. This diagrammatic drawing by Robert P. Allen, Research Associate of the National Audubon Society, shows the chief plumage patterns of the pileated and the ivory-billed woodpeckers, and should be carefully compared with the bird you have observed. The figures are drawn approximately to scale to indicate the difference in size between these two easily confused species.





Langara Island (left) and Graham Island (right), of the Queen Charlotte group, are possible nesting areas of the marbled murrelet.

Enigma of the Pacific

One of the last mysteries of the undiscovered nesting grounds of a North American bird lies somewhere in the Pacific Northwest. No one has yet found a marbled murrelet on her nest.

By C. J. Gulguet*

OUT of the misty night from the darkening surge of the Pacific, small, fast flying bodies hurtle over the headlands and disappear into the hinterlands of western North America. Their destination forms one of the last mysteries of the bird world, for no man has ever traced the route from sea to nesting grounds of the marbled murrelet. Nor has anyone studied its nesting habits, and no one has ever seen the newly-hatched young of this bird.

Authorities in ornithology of the

Pacific Northwest have little to contribute apart from theories. Major Allan Brooks, J. A. Munro, I. McTaggart Cowan, Harry S. Swarth, Kenneth Racey, S. G. Jewett, H. M. Laing, R. M. Stewart—all keen, determined workers and wise in the ways of birds—have yet to unravel the mystery of this common little alcid. So let us go over what has been learned about *Brachyramphus marmoratus* as it is known to science; the dipchick as it is commonly called, or the marbled murrelet as it is known to bird-watchers.

The first egg of the marbled murrelet known to science was taken from the oviduct of a bird shot by G. G.

Cantwell on the Prince of Wales Archipelago on May 23, 1897; subsequently others were gotten in the same manner. There are also two records of eggs said to have been taken *in situ*, that is, where laid. Unfortunately, these two records are contradictory and are not accepted by ornithologists. The first report was of an egg found on rocky land above the Tien River about 70 miles north of Nome, Alaska. Mr. A. H. Durham, the collector, is said to have taken this egg and the two parent birds on June 10, 1904. Later, in 1931, Mr. S. J. Darcus published the discovery of several nests situated in burrows in the ground on the Queen

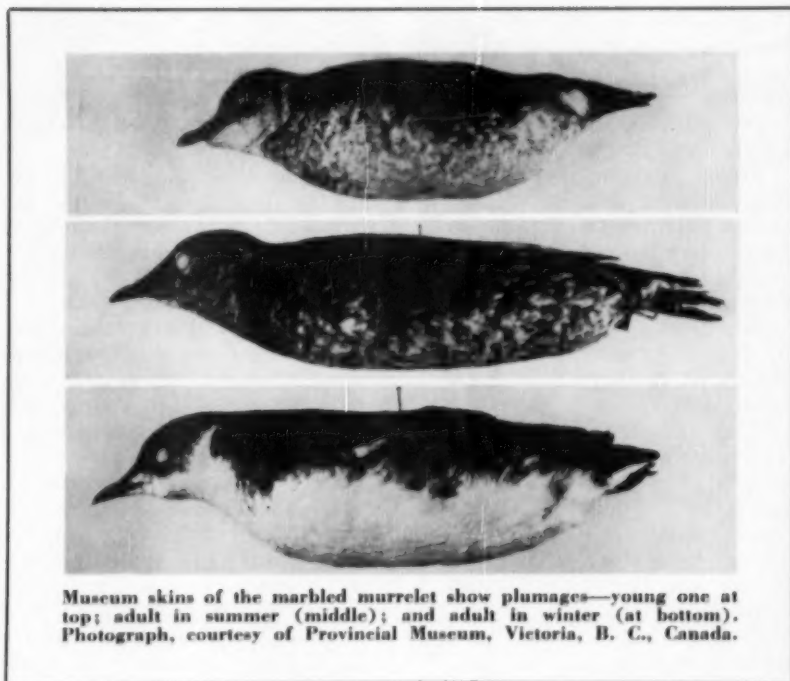
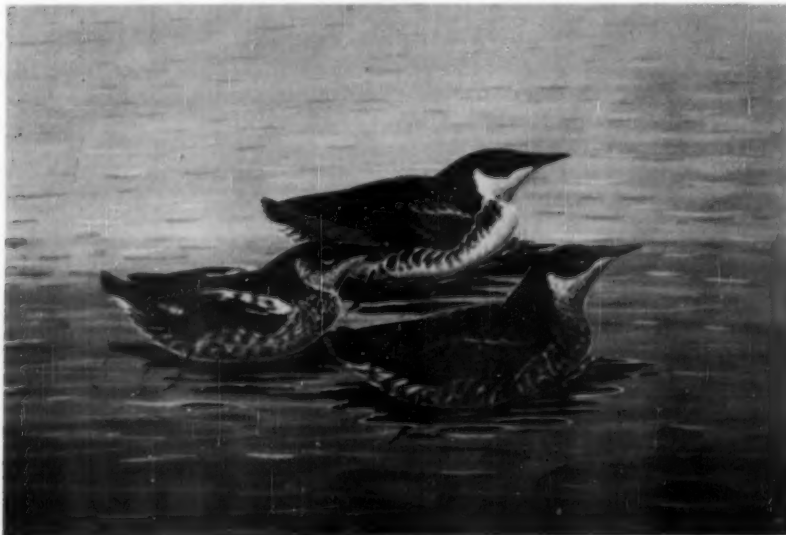
* The author is Biologist, Provincial Museum, Victoria, Canada.

Charlotte Islands. Unfortunately, no birds were collected with these eggs and some ornithologists claim the eggs collected by Darcus are those of the ancient murrelet, a common and well-known nester in the area. No one questions the integrity of these workers, but since neither has followed up and proved his finds, science cannot but regard the nesting habits of these birds as still a mystery.

Apart from the war years, I have spent each summer since 1935 on zoological exploration in coastal British Columbia. On these expeditions, some lasting up to five months, I gathered much first-hand information about murrelets. In addition, fishermen, natives, settlers, loggers, and amateur ornithologists have added bits of information. Many of these have offered leads—many were contradictory. The following is an up-to-date account of what we know about the marbled murrelet:

It is a small sea bird approximately 10 inches long and weighs about half a pound. It lives more on the inner coastal waters than do most other members of the family Alcidae to which it belongs. It eats small crustacea such as euphausiid shrimps, and fishes such as the sand lance, which it catches by diving after them. Its numbers upon the coast are legion; during the summer it is in all the off-shore waters from the Aleutians to Washington, and in the winter, it moves as far south as California.

Painting by E. L. Beebe shows adult marbled murrelet in winter (bird in rear); adult in summer (at right), and young bird (at left).



Museum skins of the marbled murrelet show plumages—young one at top; adult in summer (middle); and adult in winter (at bottom). Photograph, courtesy of Provincial Museum, Victoria, B. C., Canada.

In summer the marbled murrelet is a dark mottled brown; in winter it appears dark on the back, with white underparts. The molts take place in spring, in late February and March; in the fall, in September and through October. During the molts, it has a peculiar mottled appearance, intermediate between the summer and winter plumages. The name dipchick stems from the diving habit of these birds. Generally riding low on the water, its tail-parts

up, it dives with a sudden flip, momentarily exposing a white rear as it disappears below the surface.

Marbled murrelets move about at night, to and from their terrestrial nesting grounds, and their daylight hours are spent on the sea. During the breeding season they become agitated as daylight fails, anxious it seems, to be off to the nesting area in order to relieve the incubating mate, or to feed the young one as the case may be. It seems that they may have only one young, as specimens collected have but a single brood patch. In addition, when the young appear on the sea, only one is usually seen accompanied by the two parent birds. The young appear to be raised in the nest until capable of flight. At that time they are in a plumage resembling that of the winter adult and are, consequently, easily distinguished from their brown-colored parents. They often retain vestiges of a grayish natal down adhering to the ends of feathers about the head and back; the egg tooth may still be prominent on the upper mandible. In my studies of the breeding colonies of sea birds, I have noted a characteristic pungent odor on those that occupy burrows, an odor often persisting for days after my scientific specimens of the birds have been skinned and preserved. This odor is not present

on the marbled murrelet young when they first arrive upon the sea, which might suggest that this species does not nest underground.

Many theories have evolved as to the nesting place of the marbled murrelet. First, and quite naturally, it is thought that it may use a burrow; many birds of this family do excavate burrows in the ground and raise the young therein. A great deal of study has been done on the known breeding colonies of sea birds in British Columbia. Rev. J. H. Keene, W. H. Osgood, W. A. Newcomb, Brooks, Swarth, Stewart, Walter Maguire, and myself have all thoroughly worked Cox and Langara Islands in the Queen Charlotte group. In addition I have covered Frederick, Hippa, and many of the smaller islets along the west coast of the Charlottes—and when I searched the burrows for nesting sea birds, the marbled murrelet was always in my thoughts. Any burrow that appeared unusual I immediately excavated, but to date (apart from the questionable Darcus record) no one has ever found a marbled murrelet in an underground burrow.

On the Queen Charlottes, the Haida Indians take many birds and their eggs from the breeding colonies for food. I have questioned these natives at every opportunity, showing them specimens of the marbled murrelet and asking "where does she lay her egg?" Invariably I get the same reaction—the slow captivated native grin, or a chuckle, accompanied by a shake of the head and a "nobody knows." These natives know their birds. They excavate far more burrows than do any museum collectors. They do it year after year. If there were any marbled murrelets nesting in burrows close to the coast these people would have uncovered them long ago.

The tree theory—that they nest in hollow trees, or high in the branches, or under the roots of trees well inland—sounds logical enough when one has spent a few evenings near the ancient murrelet colonies and seen these web-footed sea birds perched on the limbs of Sitka spruce. However, the great stretches of logged-over land, thousands of square miles from sea coast to mountain top, in many sections of the breeding range, should have produced records of the marbled murrelet when the operators were denuding the

slopes. Each species known to nest in the coniferous forests has been reported many times—why not the marbled murrelet? It seems unlikely that this species nests in the coastal forest.

Some ornithologists—Laing of Comox, for example—believe that the murrelet is a cliff-nester, breeding on the face of inaccessible mountain chasms, much I suppose, as does the black swift. The black swift is a common bird, and yet the total number of nests found can be counted on one's fingers. There are many cliff faces in the coastal range that could conceivably offer suitable niches for nesting murrelets. I personally have examined many of these close to the sea with no success. The mountaineers of British Columbia are an active lot, and many of them are bird-lovers as well. People like the late Don Munday and his family, who have climbed such coastal mountains as Saugstad and Waddington, have nothing to report. Moreover, most ornithologists agree that structurally the murrelet is not adapted for clinging to cliff faces. For these reasons and the fact that most cliffs near the sea have been examined by various ornithologists interested in falcons and other cliff dwellers, with no marbled murrelets reported, it would seem that the marbled murrelet does not nest there.

Ronald Stewart, a top-notch field man and resident ornithologist on the Queen Charlottes, once put forth the theory that the answer might be found about large fresh-water lakes in the interior of Graham Island. It was reported to him by a native friend that marbled murrelets had been seen taking off at dawn from Eden Lake, near the head of Naden Harbor. These birds, the Indian said, circled to great heights and then headed for the sea. To strengthen his theory, Ronald Stewart recounted a record of an egg taken from the oviduct of a bird shot at Harrison Lake on the lower mainland of the Province many years ago. This record has never appeared in the literature, but as I recall it, Stewart actually saw the specimen. Fresh-water lakes are numerous in the coastal area, and they abound with trout. Consequently, fishermen prowl many of these lakes, yet have never reported seeing marbled murrelets there. Also, if the birds nested in

burrows leading from the water, muskrat trappers should have taken marbled murrelets long ago. If they nest on the ground, in the marshes, or on the banks, such men as J. A. Munro of the Dominion Wildlife Service, would surely have discovered them in the course of his waterfowl investigations. While it is possible that lakes may play some part in the life history of these birds, it seems unlikely that they nest in close proximity to such bodies of water.

The mountain-top theory, put forth on the strength of the nesting habits of the Kittlitz murrelet, a very closely related form, seems logical, and biologically the idea is sound. The story of the Kittlitz murrelet is an interesting one. For many years the breeding habits of this alcid were unknown, too. In 1913 F. E. Kleinschmidt, who was collecting specimens of birds at Pavloff Bay, Alaska, asked his guide if he knew where the bird nested. The Aleut guide pointed to the towering skylines and said "way far, on top of mountains, in the snow." Kleinschmidt must have taken this information with a large grain of the proverbial salt, although a local trapper corroborated the guide's statement. Later, he chanced to be up on the skylines hunting brown bear for the Carnegie Museum. In order to approach one, he took a circuitous route up through some snowfields. As he stalked carefully towards the bear, a bird flushed from a small patch of gravel that the receding snows had left. There, at his feet, was the first egg of the Kittlitz murrelet ever found in the nest.

It may be that the mystery of the marbled murrelet will be solved in a like manner. Certainly the birds are often at great heights on their way to and from the sea—but here again we have contradictory evidence. I have personally seen marbled murrelets flying in low over the timber, and upon one occasion, directly into the timber. At Masset, where Stewart, Maguire, and I have watched them returning northward to the sea at dawn, the country to the south is flat, and on the ground in those flat woods Stewart once found a fully feathered young one. Jewett, in Oregon, also found a young marbled murrelet; this, I believe, was also in a timbered area. McTaggart Cowan at the University of British Columbia, picked up a

young one on the campus in front of the library. All of these birds may or may not have been many miles from the nest in which they were hatched. All of them were in full juvenal plumage and were theoretically capable of flying. Whether they had been injured in flight, and had dropped from exhaustion, or were near the nest site prior to take-off, is unknown. Had these three birds been on the sea, no questions would have arisen, but their presence on the land, apparently uninjured, raises another problem, a point to be considered, weighed, and evaluated in the piecing together of evidence that will ultimately lead to the discovery of the marbled murrelet's nest. Jewett and others record the interesting find of E. J. Booth, who discovered a partially incubated marbled murrelet egg on the south fork of the Nooksack River in the State of Washington. There was no evidence of a nest of any kind, but the fact that the egg was about two-thirds incubated eliminates the possibility of it having been accidentally dropped where it was found. Here we have evidence that ties in nicely with the theory that the immature birds found by Stewart, Jewett, and Cowan may have been near the place of hatching. It suggests also that these alcids may, perhaps, nest in a variety of habitats.

In July, 1946, Ronald Stewart told me of a great concentration of marbled murrelets in Masset Inlet on the Queen Charlotte Islands. We watched these birds, some 200, for a day. All were in breeding plumage and all were feeding on sand launces, a small silver fish shaped like a lead pencil, and about the same size. As dusk approached the murrelets began to rise off the water and fly, circling to heights of perhaps 500 feet. Still circling they would drop back into the water, the whole flock giving their weird little calls. When darkness had almost descended some rose to great heights and disappeared inland to the west, others took off low over the water, gradually rising until they were lost in the gloom to the south. All of them were "packing feed" in their bills, and the silvery sand launce showed up in the darkness seconds after the birds themselves were lost to sight. Subsequently I have seen such concentrations on three occasions, at Cum-

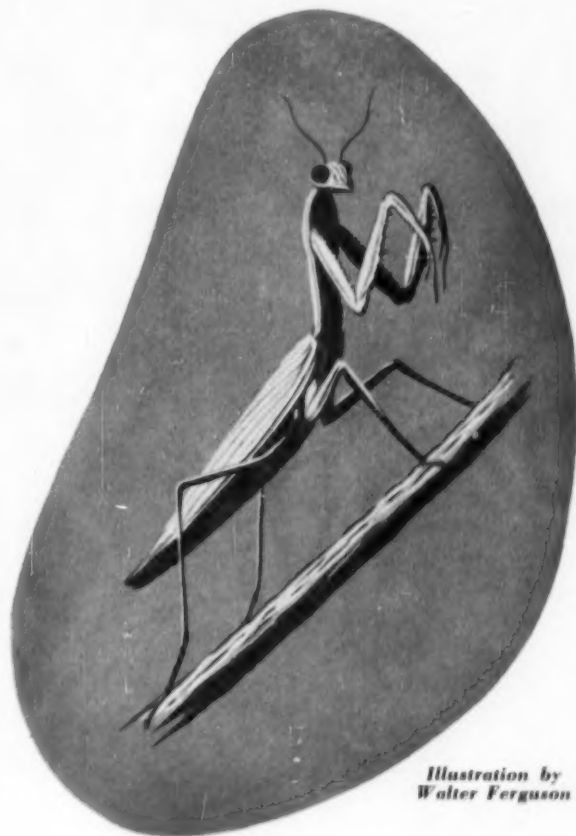
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HOW IT

GOT

praying mantis

ITS NAME



*Illustration by
Walter Ferguson*

By Webb B. Garrison

GREEKS of pre-Christian centuries were familiar with an odd, long-legged insect. It was considered to have supernatural power. So it was sometimes called the *mantis*, or "prophet." Seers consulted it, predicted future events on the basis of their interpretations of its movements.

Many legends and superstitions were associated with the mantis in later centuries. No one bothered to observe that the insect is highly

beneficial to man's economic interests—an eater of flies, grasshoppers, and caterpillars. Interest was concentrated in the fact that it often held its forelegs up, like the hands of a man in prayer. Scientists later discovered that this posture follows naturally from the insect's anatomy, and has nothing to do with its devotion or lack of it. Yet both common and learned names preserve centuries-old notions. Entomologists call one species, *Mantis religiosa*; ordinary folk know it as the *praying mantis*.
—THE END.



Illustration by Herbert Fennell.

Moths of

By Henry Harford

DURING the first decade of this century, many streets of Kansas City, Missouri, were lighted by electric arcs. The raw flame of this primitive light produced a spectral effect which the later incandescent bulb lacks. This something was irresistible to insects. On windless summer nights, there swirled about each street light, swarms of them including, at times, a few giant moths. In turn, the insects attracted spiders, bats—and boys. The spiders and bats were hungry. The boys, armed with home-made nets, sought large and rare specimens for their insect collections.

Now, at midcentury, the arc lights have been replaced by illumination of high efficiency, but of low insect allure. Missing from under the street lights, are the colorful moths with a six-inch wing span and the boys wearing knickerbockers. Perhaps, with the growth of the city, the moths have become nearly extinct. Although the boys are not yet extinct in the same sense, they often feel that status approaching. Metaphorically, they are as worn and battered as the wings of those clumsily-prepared insect specimens of long ago.

Recently, I, as one of those former "bug hunters" polished my bifocals to reread a paragraph in *Audubon Magazine* concerning the unaccount-

able rarity of *Citheronia regalis*, the royal walnut moth.*

A royal walnut was one of the two moths which had launched me and my pal on a grade-school career of collecting. Without even closing my eyes, I can still see, through the mists of four decades, the big red, yellow, and brown pattern of the royal walnut moth. Beside it was the image of an imperial moth—a big yellow and lavender creature—caught by me that same night under the arc lights. With no inkling of their rarity, we boys had wished merely to preserve their beauty.

Inquiry at the public library out-

I have forgotten the ultimate fate of these two moth specimens, the foundation of our modest collection. Probably, they were riddled by the museum pests which, somehow, manage to find and invade even isolated private collections. Information, suitable for popular use, on collecting and preserving insects was difficult to obtain then. A book written in England was available but it was not fully intelligible to us. Edwin Way Teale had not yet published "A Boys' Book of Insects." Indeed, at that time, Teale himself, was one of the boys, "bug hunting" as best he could on his grandfather's place in

may deter some natural "enemies" of these moths, but protective coloration and other visual deceptions seem to be wasted on this family. At best they are doomed to live only a day or two—they do not feed because they have no mouth parts with which to ingest food of any sort.

The mystery deepens when one learns that all cecropias are full grown—there are never any half-grown or baby ones. The creature found on the shrubbery, had emerged not many hours earlier from a bag woven of silk that had been fastened to some twig through the long winter. The key to the mys-

the Arc

lined for us two methods of killing insects for mounting in collections. One, using dried laurel leaves, appealed to our parents' judgment, because the other method involved potassium cyanide, a poison then much in the news involving a famous murder case. The dried laurel leaves merely anesthetized the moths and, after a few hours, they revived. Their attempts to escape damaged their gorgeous wings. Finally, the poison was sanctioned by our parents and applied successfully.** Our two prize moths were pinned in droopy poses in a cigar box. Dead moths and butterflies make a sad showing unless the wings are set in a formal, unnatural position which, paradoxically, always imparts life and interest to them.

Our skill as insect taxidermists improved greatly and, later, we relaxed these specimens and remounted them in the proper manner—a fairly technical operation for young amateurs. In several summers, our battered early captures were replaced with more perfect specimens but no second royal walnut moth was ever found. Perhaps there is such a thing as beginner's luck.

* See "Rare Insects," by Cyril E. Abbott, *Audubon Magazine*, March-April, 1951, p. 90.

** Potassium cyanide is dangerous for children to use. Entomologists recommend carbon tetrachloride for the use of children in making insect collections. Excellent instructions in collecting and preserving insects, and the equipment needed, are given in the "Field Book of Insects," by Frank Lutz, published by G. P. Putnam's Sons, New York, and in "The Insect Guide," by Ralph B. Swain, published by Doubleday and Company, Inc., New York.—The Editor

Do you remember the arc-lights that were so attractive to moths and other creatures 50 years ago? They are gone now, those wonderful collecting places for young entomologists.

Indiana. Unlike his contemporaries, Teale remembered his needs and, later, produced a guide for newer generations of young explorers in this perpetually exciting world. Every 10-year-old boy is a Columbus, whether his brave new world is lighted by aboriginal campfires, candles, and arc lights, or some atomic process.

In the arc-light era, an insect specimen was valued for its size and color. We had no concept of scientific values, or of rarity. Even our taste in colors was primitive. Many insects of delicate shadings we neglected, and the dull ones were ignored. Our collections were top-heavy with big butterflies and moths. Biggest and most spectacular were the moths belonging to the silkworm family. The most common then, and probably now, was the cecropia. It seldom is lured to modern lights, but will be found asleep during the day, clinging to shrubbery, trees, or window screens and the like. With its five- to six-inch expanse of color, the cecropia is very conspicuous. The body, striped with red and white, is as large as the first joint of a human finger. The males are a bit smaller. The wings are brown, bordered with tan and crossed by bands of red and white. There is a crescent-shaped patch in each wing and what appears to be a staring eye at the tip of each forewing. The suggestion of the head of a large snake

tery, of course, lies in just what entered that silk bag. A green, bulky, three-inch caterpillar with orange, yellow, and blue markings clung to the twig the previous September and, like all silkworms, began spinning a sort of tent for itself—a cocoon. The exterior was tough enough to withstand weather, but the lining was soft—the material from which silk is made.

The caterpillar, inside the cocoon, shed its skin. The new skin contained, miraculously, not a caterpillar but the body of a moth with tiny wings outlined against its thorax. Just how the transformation occurs is beyond the present knowledge of biologists. The body of the caterpillar seems to dissolve and the liquid then coagulates into the organs of a very different creature. This chrysalis lies dormant all winter and matures in early summer. The skin breaks, the cocoon opens, and out steps a big-bodied moth with thick, limp wings only a half-inch long. Special organs pump air into the veins of the wings which inflate slowly, not unlike a parade balloon with a colored design on it. After an hour, the fully inflated wings dry and harden and the moth is ready to fly. For fuel, it must use the excess food stored in its tissues as a caterpillar. The emerging moth, obviously, must climb and cling to something so that the wings hang down with space to expand prop-

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IS THE RAVEN COMING BACK IN THE SOUTHEAST?



Photograph of a raven by Hugh M. Holliday.

By Alexander Sprunt, Jr.

THESE is probably not a bird in history which has figured so direly in legend, superstition, and folklore as has the raven. The result of this has been its persecution, almost to the verge of extinction in some places throughout its wide range, including much of the eastern part of our country. A generation ago our northern raven, *Corvus corax principalis*, had all but disappeared in the eastern United States, except along the coast of Maine. And its local extirpation was largely caused by superstitious ignorance.

An amazing number of people go about under a constant dread of incurring "bad luck" by breaking mirrors, walking under ladders, raising umbrellas indoors, or in crossing the path of a black cat. All these and many other similar puerile superstitions have a stronger hold on people even today, than one might think. When such unreasoning attitudes extend toward and embrace any living creature, woe betide it! Such was the raven's fate, and so it has been for centuries, both in the Old World and in the New.

Innumerable legends, stories, and beliefs have been built around the bird from early times, and thousands of people have lived in dread of

ravens. Space limits preclude great detail, but an example or two will be illustrative. Charles Waterton in his *Essays* (London, 1870) indicate this general feeling of dread:

That raven on the left-hand oak,
Curse on his ill-betiding croak,
Bodes me no good!

Again, Grower's "*Confessio Amantis*" contains the following:

A raven by whom yet men maie
Take evidence, when he crieth,
That some mishap it signifieth.

Last, the fear with which many regarded the somber bird as a spreader of disease is vividly described in "*Jew of Malta*" (Marlowe) in this verse—

Like the sad presaging raven that
tolls
The sick man's passport in her
hollow beak,
And, in the shadow of the silent
night,
Does shake contagion from her
sable wing.

So it went. Even the sight of the bird was an evil omen, and if one alighted on church or dwelling it was taken as a certain sign of death or disaster. Should a sick person be in any such dwelling, quick death was sure to follow. Many of these superstitions of Europe and else-

where were brought here by the early settlers. The occasional predatory habits of the raven did nothing to alleviate the ill-will against the bird. Its attacks on young domestic animals—kids, lambs, and poultry—evoked the wrath of farmers and overcame superstitious dread to the extent of frequent shooting of ravens. This grew to be a confirmed habit. It seems certain that some animosity toward the raven and superstition about it persists in remote areas such as the coves and valleys of the Blue Ridge Mountains, whose early settlers and many present-day residents are of Anglo-Saxon stock. Undoubtedly, their attitude toward the bird has been handed down for generations.

In recent years, however, the raven has reappeared in the Southeast to a gratifying degree and is staging a definite "come-back." In the use of this expression one thinks almost automatically of our egrets, but though the egrets have increased greatly, neither of the "plume birds"—the American egret and the snowy egret—even at their lowest ebb, ever had any onus attached to them, as did the raven. The egrets were killed because of their beautiful feathers; ravens were often killed because of superstitious fear of them. Both white birds and black, are, happily

now, reaping the harvest of enlightened public opinion.

While it is not possible to give any population figures of the decline, scarcity, and eventual increase of the raven, something may be visualized of its rarity 30 years ago from my experience as a bird student in a favored part of the raven's original eastern range. As a boy, a youth, and an adult I spent each summer, or a great part thereof, from 1914 to 1934, in the high Blue Ridge Mountains of western North Carolina and Virginia. I made several visits to these areas afterwards

from 1942 to 1945. This country is dominated by two peaks of some fame—Mt. Mitchell of 6,684 feet altitude, and Grandfather Mountain, 5,964 feet above sea level. Mt. Mitchell is the highest mountain east of the Mississippi River, and was about the heart of the raven's range in the old days.

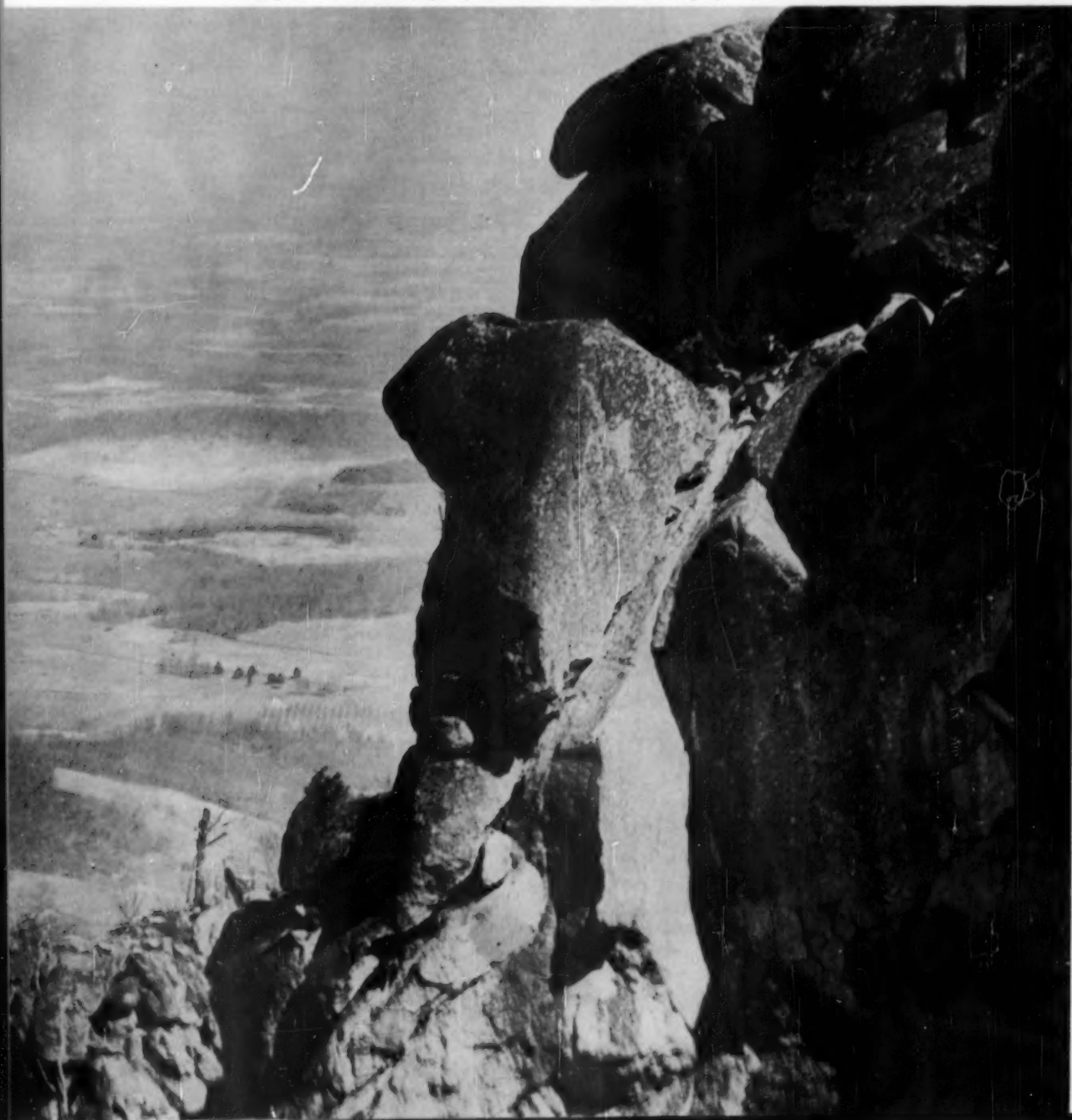
Each summer, I made camping trips to then very remote areas, and kept a constant watch for birds, always with the consuming desire to see a raven. In the summers of the 1920's I had a kindred spirit as field companion, James J. Murray of Lex-

ington, Virginia, and we learned much about the mountain birds. I had not yet seen a raven, but Dr. Murray had! Near his home in the famed Valley of Virginia, a few occurred, and while on a visit there, I saw my first raven on August 15, 1931.

Since then (excluding many subsequent observations of the bird on the Maine coast) I have seen ravens in localities that I visited many times before, without ever a glimpse of one. The Blowing Rock-Linville, North Carolina resort region, over

Continued on Page 182

Nesting site of raven along Skyline Drive, Virginia. Photograph by W. Bryant Tyrrell.



Johnny F. AND THE BIRDS

Illustrations by Herbert Fennell.

This is a mother's appealing account of how she learned to identify birds. We believe that many of our readers will re-live their own early struggles with field identification of birds while reading Mrs. Bullard's story. Two boys—her son, and her son's dearest friend—taught her what she calls "the beginning of a lifetime avocation."—The Editor

By Mabel Elizabeth Bullard

ALL the while we walked, the boys were busy pointing out things that they were anxious for me not to miss: a blue-winged warbler (I must confess I didn't notice much blue at that stage), a warbling vireo, a yellow warbler, a rustling in the leaves that I was assured was a towhee, although I couldn't honestly say that I saw him. The next nest was that of the yellow warbler in which were three tiny spotted eggs—and one large cowbird egg. I asked Johnny F. why he did not remove the cowbird egg but he said that he preferred not to interfere.

For me the highlight of the day was the sight of a mother mallard swimming with at least 10 ducklings following her. When she led them ashore the boys rushed them and caught a duckling to show me. What a dear, downy little creature it was! When released, it fairly "ran" over the surface of the water to its mother that had led the others to a safe distance downstream.

I learned to recognize the rough-winged swallow that day. Eager to prove that I knew *something* about the birds, when we approached a bridge which I cross regularly, I announced, "Chimney swifts," pointing in my ignorance to the aforementioned rough-winged swallows. It was Johnny F. who pointed out to me that they have more tail than does the stumpy-tailed swift.

From then on the days began to

fall into a regular pattern of hurrying through the necessary functions of living in order to make it possible for me to squeeze in a little nature exploring each day. On Sat-



"The birds do not wait for the dawn, but are already stirring..."

urdays we sometimes managed to devote an entire morning to birding. Let me describe our adventures on one outstanding Saturday morning early in June.

Johnny F. bunked with Arthur overnight so that we might start out before daybreak. They groaned a little at this idea, but I insisted upon it, since 5 o'clock is the best birding hour. It is also the very best hour for communing with one's soul. On this particular morning, we headed for the shore.

Who can describe the stillness, the quiet restfulness of the beach at that hour, with the sun just beginning to flush the eastern sky? The birds do not wait for the dawn but are already stirring. A dour-looking black-crowned night heron stands on one leg at the edge of the water philosophically waiting for something to show up for his breakfast. It is more than a bit moist, but we rejoice in it, feeling suspended in

the cradle of the morning mist. The gently receding tide whispers little secrets to the shore. Gulls begin to stir on a small rocky promontory ahead of us. We all speak softly in the presence of the awakening of a virgin dawn.

By the time the sun is full up, flocks of small birds are wheeling and calling over the beach. The night heron leaves for another spot, dropping one melancholy "Quawk!" on his way. In the marshes back of us we can now hear the bubbling of the long-billed marsh wrens in the *Phragmites* and occasionally catch a glimpse of a sharp-tailed sparrow flying just above the meadow grasses.

Suddenly, from the other side of the peninsula on which we stand arises the most outrageous clacking that I have ever heard from a bird. Johnny F. assures me that it is a clapper rail. (I didn't see it this day, but five days later, after a most patient and diligent search, I was rewarded. Whether it was male or female I was seeing I could not tell, but it looked like nothing so much as a dowdy, plump hen.)

A single beautiful white bird flies slowly across the peninsula. The boys immediately pronounce it an American egret. I do not doubt them, but I decide to make some notes and to look it up for myself, hoping in that way definitely to remember it. Our field guide shows five graceful white birds on the page with the egrets. I want to know why it cannot be any one of them. How, in particular, do I know it is not a great white heron? It takes only a moment for me to read that it is restricted to lower Florida and the Keys. So I work my way through the text, and by the process of elimination, arrive at the conclusion that it was without a doubt an American egret.

I recommend this method of bird study to all who are meeting new birds for the first time, in the company of a more experienced bird student. Your attitude should not convey that you doubt his word, but that you are entirely sincere in wanting to learn exactly *why* it is the bird that he says it is. I have only to close my eyes now, at any time, to be able to see the American egret in my mind: the gracefully undulating motion of the powerful wings, the neck folded back to the shoulders, the legs extended in the rear as it flies.

Johnny F. calls out the identity of many small birds which drop down to the beach in front of us, and I choose the spotted sandpiper to concentrate upon. I wonder why it is not called the "beach thrush," with such a speckled vest. I decide that it is very distinctive, but like many a well-dressed fop, walks as though its shoes were too tight. I cannot imagine why, but I do get much pleasure from attributing very human traits to the birds.

Many small fishing boats are heading out into the Sound now, and we can hear the voices of the fishermen talking to one another over the sound of their motors. I would be content to settle down for the entire morning and just soak up sights and sounds. But suddenly Johnny F. "freezes" into an attitude of listening, and motions to Arthur and me to listen a moment, too. He is certain that he has heard a loon, and that it is somewhere off a beach in an adjacent township which we are just able to see across the water. I have learned by now not to doubt his extra-sensory equipment in these matters, so we climb into the car and drive there. And there we see our loon—a common loon swimming about quite calmly just offshore. To our added delight there is also a flock of buffleheads.

We would have considered it an entirely successful expedition if we had turned back just then, but something led us on to a nearby state park. There, with great rolling meadows behind us and Long Island Sound before us, we perched on a stone wall, probably looking like three birds ourselves. A flock of old squaws was drifting about a short distance offshore. Since there did not seem to be anything else in view,

and it was well past the breakfast hour, we turned back toward the car. Up from the grass arose a meadowlark, flinging his sweet notes into the morning air as he flew. When the boys finally jogged me from my trance, I discovered that I had my hands clasped tight in a prayerful attitude. Nothing more beautiful had crossed my path since I had seen and heard my first meadowlark as a little girl in the pastures near my home. Nothing can uplift my spirit any more than this.

It would sound more sane and proper now, if I were to say that, after returning home for pancakes and eggs, we tackled our day's chores, sustained by the memory of our inspiring experiences and the addition of several birds to our lists. We did not. We piled the dishes in the sink and turned our auto in the opposite direction, toward the beckoning fields and woods. If I was a little out of my normal sensible frame of mind it was not too painful a condition. I had capitulated to the entreaties of spring's lure and the boys' urgent pleas. Quite readily I went forth again to meet nature in her own fort with only a mild pang of my conscience. Truly, I felt that I could not afford to spend one springtime hour indoors, just then. As an added persuasion, the boys promised me that they knew where a ruby-throated hummingbird was nesting. Later,



"The easiest way to observe is to lie on a mossy bed..."

when I saw the nest, it seemed to me like a minor miracle that they had ever discovered it at all. It was necessary to circumvent a large meadow and to plunge deep, and yet deeper, into woods that were understored for some distance by brambles and

thickets—mostly barberry, run wild. After much scrambling over fallen logs, tearing through thickets, stumbling over rocky stream beds, and climbing stone walls, we emerged in an open wood whose floor was covered with the springiest type of moss. I am a poor judge of distances, but it seemed to me that the nest was at least 20 feet off the ground.

"However did you find it in the first place?" I asked them.

"We saw it carrying nesting material, so we followed it," they answered. This was quite logical, but imagine crashing through all that undergrowth, keeping your eyes all the while on a flitting hummingbird, yet noting your trail so that you might find it quite readily again! There was not even the sound of civilization's rumbling to be heard there: only the hurled challenge of a red-shouldered hawk and the happy outpourings of a multitude of songbirds.

The easiest way to observe the hummingbird coming and going, at that height, without developing a crick in the neck, is to lie on the mossy bed. All I needed was an excuse! I was, indeed, a child again in that moment. You then wait until you see the wee nester dart toward a branch, hover an instant, and then disappear into a knob on the branch's upper surface. The knob is the nest.

While we were thus engaged, we noticed another small woodland sprite—larger than the hummingbird, but tiny enough to have passed unnoticed if we had not already been in a position to see it.

"A wood pewee," said Johnny F., without a moment's hesitation. My son, Arthur, whom we always refer to as the "eyes" of our small band, discovered her in a twinkling, nesting on a branch only a few feet from the hummingbird. Had these two birds conspired to settle thus in order to avoid loneliness during their long vigils on the nest? Certainly they were dwelling side-by-side in peace and harmony. Neither did they seem to fear us, nor to resent our presence in their quiet wood.

It is difficult not to make an account of a spring bird trip read like a glorified bird-list. The woods about were ringing with the songs of chestnut-sided warblers, red-eyed vireos,

Louisiana water-thrushes, and hooded warblers. I watched the birds carefully, and listened attentively, but one does not note each bird to remember it upon one fleeting glance or from hearing its song on one spring day. At any rate, I do not. So, you see, I have so many good reasons for returning again and again to those quiet woods.

Not all my field trips are planned affairs. One Saturday morning, I was in the midst of polishing the kitchen floor. I looked up, and saw Johnny F. through the window, sprinting like a Greek runner carrying news. Panting heavily from the exertion of his rapid climb up the hill, he managed to gasp out that there was a blue-winged teal on the pond. Unfortunately, Arthur, whom he was seeking, was not at home. Would I like to see a teal? *Would I!* I was still smarting from my experience with the "teal" that had turned out to be a mallard.

We had no way of knowing that the teal was planning to spend some time there, and we felt pressed by the kind of urgency that tells one that every second is important. So, rather than go round to the public side of the pond, we cut through a very private looking backyard and out onto the dried-up pond bed, through brambles and tangles and *beggars' ticks!* Let it be said for Johnny F. that he tried to warn me just before I blundered into a patch, and emerged covered from head to toe with thousands of that plant's little tined forks. Many a merry hour spent I, rooting them out. I discovered that they do not stick quite as tightly to dungarees as they do to nylon socks and soft woolen jackets.

It took several minutes of searching to find the little duck among the pickerel weeds. Has no one written an ode to this dainty fellow? No poet I, or I should do it myself. How lightly he sits on the water; how proudly he holds his head and prettily dips for food. This is October, so I do not know whether I am seeing male or female, for the texts tell me they are both alike after mid-July. I shall have a real treat when someday I see this exquisite bird in spring plumage.

I hope I have not seemed discouraged over my difficulties in learning to identify birds. It is only at times that I become exasperated, and later

I always enjoy laughing at myself. There are few joys to compare with the triumph of adding just one more bird to the list of birds that I can readily identify. Because we look at and admire so many facets of nature besides the ornithological wonders, our fielding experiences are exhilarating and uplifting. We are often caught speechless in the wonder and beauty of some natural phenomenon. Scarcely a day passes that Johnny F. does not draw our attention to the changing sky or Arthur does not find some odd creature for us to examine in amazement. I shall not be surprised if one summer of fielding has led me into a lifetime avocation, and that I shall evermore feel more alive and at home where I can com-

mune with God's creatures, big and small, animal and vegetable.

The final entry for May in my journal expressed my frame of mind exactly over my newly entered adventure:

"When I thanked God for my blessings last evening I was coming up the river in our small boat. Arthur, looking grubby after a busy day of birding, was in the bow; Johnny F., amidsthips, was still scanning the distance for birds; and Ladybird, wringing wet from chasing killdeer on an island, had her head in my lap. Dad, at the tiller, looked quite at peace with the world. For a quiet moment I was at peace, not only with the world, but with all of eternity."

—THE END

ENIGMA OF THE PACIFIC—Continued from Page 167

shewa Inlet on Moresby Island, at Frederick Island, and near the mainland on the Bardswell Islands. In each case the first concentrations of young birds were seen on the sea the following morning. A very exciting possibility exists in this behavior, for here in a breeding concentration of adults feeding young, may lie the key with which to unravel the mystery.

I could tell more of this intriguing search—of hours spent by night on shores and skylines, listening for the cry of the marbled murrelet; of a series of camps, from skyline to a shoreline where they had been seen flying in; of searches in the talus slopes and rock slides of the alplands; and of hand and knee crawling with digging irons through Pacific West Coast salal jungle.

The latest evidence received at the British Columbia Provincial Museum is of great interest to us. A stunned marbled murrelet was taken from the debris of a large hemlock felled on the Queen Charlotte Is-

lands in 1953. The logger, Walter Feyer of Masset, a reliable amateur bird-watcher, examined the murrelet and found it had a brood patch. Further search in the debris uncovered the fragments of a marbled murrelet's egg, but no evidence of a nest of any kind was found. That no nest was found is not important, for many birds do not gather material and build nests. However, there was a bird and a broken egg in the debris of that tree. Whether the tree had fallen upon a nesting site, or whether the egg and the bird were in the tree before it was felled we don't know. But there seems little doubt that Walter Feyer was very close to a nesting marbled murrelet that day. Unfortunately, he was unable to uncover further evidence.

Thus, as far as we know, the nesting behavior and nesting habitat of the marbled murrelet remains unsolved, and still presents an intriguing problem to ornithologists.

—THE END

THE MEANING OF WILDLIFE INVENTORIES—Continued from Page 151

and the woodcock on its singing grounds. The quail is counted by its whistled calls, the rabbit by live-trapping it at night, or by road-side tabulations; squirrels by their leaf nests, and muskrats and beavers by their houses.

Many wildlife counts are made on the ground, but with deer, antelope, elk, beavers, muskrats, moose, and caribou, the count is often made from aircraft. Deer are sometimes counted by their pellets dropped, or by counts of their tracks. When help was plentiful, as in the days of the Civilian Conservation Corps, occasional inventories were made by driving deer in an area past a

counter stationed ahead of the deer.

Regardless of the type of inventory, the place, the kind of wildlife, or the men doing the work, wildlife managers are no longer interested in the numbers of animals for numbers' sake, but their numbers for comparative purposes. The thousands of deer or the millions of ducks are not the important data. What is important is whether or not the species is holding its own under current conditions, whether its numbers are becoming fewer or are increasing. When this is known the trend is evident and proper plans can be put into effect for its management.

—THE EDITOR

In the Beginning—

An Early History of Our Origin and Growth

Part VII (conclusion)

EDITOR'S NOTE: This is the last article of a series in which we have re-published a report, "History of the Audubon Movement," by William Dutcher, that appeared originally in the January-February 1905 issue of *Bird-Lore*, the predecessor of *Audubon Magazine*. The first part of this historical report (a report which had been unavailable to most of our readers) appeared in our March-April 1955 issue—our Golden Anniversary Year—and in successive issues for 1955. The next to last installment appeared in our March-April 1956 issue. This is the concluding article.

Origin of The Second, or Present Audubon Movement

The second cycle of bird protection practically commenced in January, 1896, when the system of State Audubon Societies was started by the organization of a Society in Massachusetts; this was followed by one in Pennsylvania, and thereafter state organizations followed in rapid succession, until now there are societies in thirty-five states, one territory and the District of Columbia. Many of these societies are large and flourishing ones, some of them being incorporated. The Society in North Carolina is unique in that it acts in that state as a Game Commission with power of appointing bird- and game-wardens who can arrest violators of the game-laws.

Uniform bird legislation was found to be absolutely necessary and has rapidly been secured, so that at this date the model law is in force in twenty-eight states, one territory and the Northwest Territories in the British Provinces. In addition, the Audubon Societies, individually and through the National Association, have exerted a vast and valuable influence in game-bird protection, having found it impossible not to become interested and involved in the important branch of economics. All of the societies stand emphatically for short open seasons, no spring shooting, non-export, no sale of game, and every known method of preserving the rapidly diminishing game-birds of the country.

Another of the gains is the powerful auxiliary to Audubon work, the very excellent illustrated magazine *Bird-Lore*, now in its seventh volume, which is the organ of the societies, and is a medium of exchange of thought, methods and news between the several state Societies, and serves to keep them in touch with one another; further, it is a means of

communication between the officers and committees of the individual societies and their members. This magazine is of the highest character, being scientifically correct and correctly popular; the editor having kept up to the high standard promised in his editorial in the first number, February, 1899. The several societies and bird lovers at large can in no surer way advance the cause of bird protection than by extending very widely the circulation of our official organ, *BIRD-LORE*.

The Thayer Fund

Early in 1900 Fashion had again attacked the Gulls and Terns, and dealers said that the demand for these skins far exceeded the supply. An appeal to bird lovers was made by Mr. Abbott H.

The "Weaning" of a Cardinal

Several years ago, we had a bird feeding station quite near a screened porch where we were accustomed to dine on pleasant evenings. The feeding station was kept supplied all summer and quite a few birds were steady boarders. We noticed especially a pair of cardinals because the male bird and a young one continued to come every day after the mother had ceased to appear. The station was one of the box type, with one side open and one side glass, the whole revolving with the wind at the top of a post.

For a long time the young one would wait on the flat roof of the station while the father flew back and forth from the feeding area carrying one grain at a time to the infant. One evening in September, we noticed that the father was feeding himself in spite of shrill objections from the young one, accompanied by the usual violent fluttering of the wings. After a time the parent flew up to a point slightly above the level of the feeding station and about 10 feet off and then swooped down hitting the youngster with his breast and knocking him off the station. In a moment the young bird was back on the roof of the box, making the same commotion as before; and once again, the father, following the same pattern, knocked it off the station. They both flew away at that point, but the next evening when they returned the young bird was down in the box feeding itself alongside the parent.

WILLIAM LAMBERT KLEITZ
New York City, New York

Thayer, and through his efforts a generous fund was raised which was used for special protection to sea-birds during the breeding season, wardens being employed for this purpose. Mr. Thayer has diligently and patiently worked to continue the fund from year to year, with annually increasing results, so that during the past year thirty-four wardens have been employed, as follows: Maine, 10; Massachusetts, 1; New York, 2; New Jersey, 2; Virginia, 8; North Carolina, 4; Florida, 4; Texas, 1; Michigan, 1; Oregon, 1; and a contract has just been made with a warden in Louisiana.

Formation of the National Committee

In November, 1900, an important meeting took place in Cambridge, having as its object the discussion of the Federation of the State Audubon Societies in order to strengthen the bird-protection movement and more effectually place it upon a lasting basis. A committee was appointed, which reported at a meeting held in New York in November, 1901, as follows:

1. That the several societies retain their individuality, that is, that they be not merged into a National Organization.
2. But in view of the increased efficiency that would always result from some form of union, which would admit of concerted action, it is recommended that,
3. The several societies shall each appoint one member of a Committee to be known as the National Committee of the Audubon Societies of America.
4. That members of the Committee may be empowered to represent the societies whenever concerted action on the part of the societies be deemed by the Committee expedient.
5. That an annual Conference be held.

Since 1901, the National Committee has had charge of the formation of new Audubon Societies, the fostering and encouragement of the new and weaker organizations, the warden system, legislations, and general educational work, and it is also an additional medium of exchange between the several state societies. In 1903 the National Committee began to issue a series of illustrated leaflets for educational purposes.

The above resume of the bird-protection movement, from its inception to the end of 1903, is presented in order that the public may have in concise form a history of the movement.

If desired, fuller details may be obtained in the published reports from 1896 to 1903 of the work done in those years.—THE END



A modern spray-rig applies about 35 gallons of insecticides a minute on trees and shrubs. Photograph, courtesy of U.S. Department of Agriculture.

According to an authority, there are more than 2,000 different brands of insecticides, fungicides, or combinations of both, on the market. A biologist of the U. S. Fish and Wildlife Service discusses the potential effects of some of these new sprays and dusts on birds and other kinds of wildlife.

INSECTICIDES

Boon or Bane?

Dr. A. L. Nelson (left) and Dr. Ray Treichler examine mallards that have been subjected to experiments with insecticides. Photograph, courtesy of U.S. Fish and Wildlife Service.



(Concluding article)

By Paul F. Springer

MOST studies with insecticides have been concerned with the animals present at the time of treatment, and have given the impression that the effects of an application ended with either the survival or death of the individual animals. Recent experiments at the U. S. Fish and Wildlife Service Refuge at Patuxent on reproduction of birds fed less than lethal amounts of insecticides have shown the possibility of less obvious effects. Adult pheasant's that ate extremely small quantities of aldrin and dieldrin—one-two hundred thousandth of an ounce per day for a two-month period—produced eggs of reduced hatchability and chicks subject to high death rates. Feeding of one-fifth this amount of each of these chemicals, also of endrin, to adult quail had a similar effect on the survival of their chicks.

Studies are being continued to determine whether there is any influence on reproduction by the few remaining young, which have never eaten any of the insecticides. The demonstration of these subtle effects points up the danger of using stable insecticides with high residual qualities.

What Happens to Fish and Small Food-Chain Organisms?

Oddly enough, some of the organic phosphates, which are extremely damaging to mammals and birds, appear to be less harmful to fish than the chlorinated hydrocarbons. TEPP breaks down rapidly in water and only its initial effects are important. Less is known about the harmfulness to fish of other phosphate chemicals. EPN had no effect when applied experimentally for control of mosquitoes at applications of less than one-tenth of a pound per acre. However, a dosage of two-tenths of a pound per acre of malathion caused complete mortality of killifish.

Among the chlorinated hydrocarbon insecticides, endrin was the most toxic of a number tested on fish in laboratory experiments. Both dieldrin and toxaphene are considerably more damaging than DDT and have killed fish when used to control mosquitoes at a rate as low as one-tenth of a pound per acre. Ten times this dosage of dieldrin is destructive to almost all kinds of water life. In the South, toxaphene and other insecticides have been used extensively to control insect pests of cotton, and average seasonal applications of commercial dusts may total 50 to 60 pounds to an acre. Large losses of fish in Alabama resulted from heavy rains which presumably washed insecticides from the treated cotton land into ponds and streams. Follow-up investigations two to three years later showed that some of these waters again supported normal numbers of fish. However, most of the bass, sunfish, and crappies were still absent and populations were unbalanced in favor of undesirable, non-game species of fish. In laboratory tests, heptachlor and aldrin were more damaging than was DDT, but single field applications of up to two-tenths

of a pound per acre for control of midges and mosquitoes had little effect on fishlife. An experimental spraying of one pound of lindane per acre killed many fish.

Chlordane and *methoxychlor* are about in a class with DDT in their effects on fish. A single test treatment of chlordane at one pound per acre, and sprayings repeated weekly over a three-month period at one-tenth pound per acre to combat mosquitoes, killed large numbers of fish. All fish succumbed to an experimental treatment of two pounds of methoxychlor per acre.

Of the chlorinated hydrocarbon insecticides, TDE and BHC are the safest to fish and are recommended for use in areas where preservation of aquatic life is a consideration. TDE was used at a rate of one pound per acre to reduce the nuisance caused by midges with little damage to fish, but 14 weekly sprayings of one-tenth this amount for control of mosquitoes caused some reduction in the fish population. Applications of one pound per acre of BHC repeated five times a summer for three years gave good control of mosquitoes and had little or no effect on the survival and growth of fish. However, their flesh may become tainted with the characteristic odor of this insecticide.

Some fish are consistently more resistant than others to poisoning by the new insecticides. In laboratory tests, golden shiners proved to be the most resistant, with bluegill sunfish, largemouth bass, and goldfish showing increasing susceptibility.

The type of carrier with which an insecticide is combined also has an important bearing on how fish survive. As a rule, emulsions are most dangerous because they mix with water, and remain distributed in a body of water. Dusts, wettable powders, and granules tend to settle to the bottom where they are not as readily available except to catfish, suckers and other bottom-feeders. Since oil solutions float, for the most part, their hazard may be considered intermediate. They are particularly dangerous to fish which feed at the surface of the water. Also, wind and wave action can build up accumulations of insecticides in oil solution, on the leeward sides of lakes and ponds which may be several times the amount originally applied.

The question is often raised as to the effects of insecticides on some of the lower animals, which are of direct economic value, and on those which serve as food for higher forms of animal life. Particular concern is felt for honey bees because of their role as pollinators of crops and garden plants. Toxaphene, methoxychlor, and TDE are three of the least harmful to bees. Chlordane is similar to DDT in its effects on honeybees, and BHC, lindane, aldrin, heptachlor, TEPP, malathion, chlorthion, diazinon, and EPN are more toxic. Parathion and dieldrin are among the most destructive insecticides to bees; in fact, dieldrin may continue to kill bees a week after it is applied. Crabs, shrimps, and aquatic insects are usually very sensitive to the new insecticides and, as a general rule, suffer damage from even smaller dosages than those that affect fish. Clams, oysters, and snails are more resistant to most of these insecticides.

With higher animals, the indirect effect of a reduction in their food supply, is difficult to distinguish from the direct poisoning of them. In an Illinois bottomland forest, the destruction of crayfish by DDT caused raccoons feeding on them to change their diet to acorns and mussels but had no other untoward effect. However, where insecticide applications have caused nearly complete kills of insects over extensive acreages, as in grasshopper control programs, nestling birds may lose weight and suffer high death rates. Also, under these conditions, parent birds tend to forsake the area. On small treated plots, nestlings may be harmed, but adults on a small 20-acre tract were not adversely affected, probably because many of them normally foraged in an adjoining untreated habitat. It is easier, too, for insects to infiltrate into small areas and repopulate them.

The young of many animals are more severely affected by insecticides than are the adults, and appear to be inherently more sensitive. This susceptibility is aggravated by the fact that the dietary requirements of young animals in relation to body weight are considerably greater than those of older animals. Accordingly, they would normally consume proportionately greater amounts of contaminated food.

In water and marshland areas, considerable reductions in the numbers of insects by DDT generally have been observed to have little or no visible effect on the survival of fish, because fish can subsist for a time without food. Unless residual amounts of insecticides are present, the insect food-supplies of fish will generally repopulate quickly by infiltrating from untreated areas. However, in a study of Idaho streams, the numbers of fish and their insect-food organisms were still at a low level one year after treatment, and the recovery of insects was still incomplete in the second year. Repopulation by stream inhabitants is slowest where the entire headwaters of streams are treated with insecticides and animals have to invade by moving upward from the lower part of the waterway.

What Should or Should Not Be Done

Bird-watchers, garden club members, and other conservation groups, have a justifiable concern as to the possible hazards to wildlife from insect-control operations. Often though, they do not know what facts to obtain about an insect-control program, or how to evaluate them. Sometimes, too, there is a tendency to condemn *all* insecticides without considering the good resulting from their use, or, because of isolated cases of damage which may have been carelessness in the use of insecticides in what might have been an otherwise safe program. Entomologists are just as open-minded as any group of people, and most of them are anxious to limit wildlife losses to a minimum. At times entomologists may not be aware of the wildlife values of an area. When these are called to their attention, they may be able to modify the insect-control program or to utilize alternative control measures in order to avoid significant damage to wildlife.

The primary factors to be considered in appraising the possible damage to wildlife from an insect-control program are (1) the kind of insecticide to be used (2) the rate at which it is to be applied (3) the animals apt to be adversely affected. As has been shown, insecticides are far from specific in their action and show con-

siderable variation in their effects on various kinds of wildlife. Except in an emergency, conservationists have a right to insist upon balanced programs using the safest materials and methods of application consistent with reasonable control. At times, damage to beneficial animals has occurred through use of very dangerous materials or heavy dosages in order to secure quick, and more lasting control at a lower cost. Of even greater significance is the tendency on the part of some users to apply more than recommended amounts of insecticides "for good measure." Such a philosophy not only endangers birds and other kinds of wildlife, but is often wasteful of materials and may aggravate the insect-control problem. *Strict compliance with instructions on labels, and following the recommendations in state and federal insect control bulletins will probably, more than any other measure, reduce the extent of present-day insecticide damage to wildlife.*

Time and frequency of application also are important factors to consider in insect-control operations. Hazards to birds are reduced if treatments are made before eggs hatch or after the young are able to fare for themselves. Bees suffer the smallest losses when insecticides are applied in the evening, a few days before the height of flowering, or after blossoms have fallen. Although a single treatment may have little lasting effect on wildlife, repeated applications can again set back populations before they are able to fully recover or can cause insecticides to accumulate until dangerous accumulations have been built up.

Another factor to bear in mind is the size of the area to be treated. Smaller areas will be repopulated by animals much sooner than large ones. If compatible with insect-control objectives, provision should be made in programs covering large areas to leave blocks, strips, or headwaters untreated. Inquiry also should be made as to the manner in which insecticides are to be applied. Spray deposition is less from aircraft application than from ground equipment. In forested areas, leafy canopies may screen out insecticides so that only one-third to one quarter or less reaches the ground level. However, the drift of insecticides from aerial sprays by aircraft may cause double

dosing or result in deposition in other than the area in which control is desired. *For this reason, insecticidal spraying from aircraft should be avoided in windy weather and provisions should be made for adequate ground-to-plane control.*

Because of the sensitivity of fishes, crabs, and other aquatic life to many insecticides, direct application to streams, lakes, and coastal bays should be avoided as far as possible. The equipment used to apply the insecticides should never be washed in these waters. Caution should also be exercised in applying materials near water and marsh habitats if there is danger of their being washed into the water areas by rain. Smaller quantities of insecticide are recommended for use in emulsions, due to the increased dangers to many aquatic animals.

Although there is little doubt that chemicals are here to stay, the evolution of insecticide-resistant insects, and the suppression of one form, only to cause the increase of others of perhaps even greater concern, has forced entomologists to take a second look at current insect-control practices. As a result, it is encouraging to note, in some quarters, an increased emphasis on developing more specific chemicals and methods of application that, insofar as possible, kill only the insect to be controlled, while leaving other animals unharmed. Also, there is greater recognition of the need for learning more about the biology of certain insects and their relation to the environment. Armed with such knowledge, entomologists can often devise measures for reducing losses to insects that are based upon biological or ecological principles. These include the development of varieties of plants resistant to insect damage; attracting and increasing birds and other natural enemies of insects; planting and harvesting crops at particular seasons; proper fertilization and rotation of crops; destruction of insect wintering quarters; intelligent regulation of water; and the manipulation of other biological factors that will reduce insect nuisances. Such measures may never replace completely the need for insecticides. They can, however, serve as a basic approach, and can lessen appreciably the extent of the insect control problem.

—THE END.

What Do You Know about Insects?

Here is a quiz to test your knowledge of insects. Each question has three possible answers. Only one is correct. How well can you score? Answers on page 187.

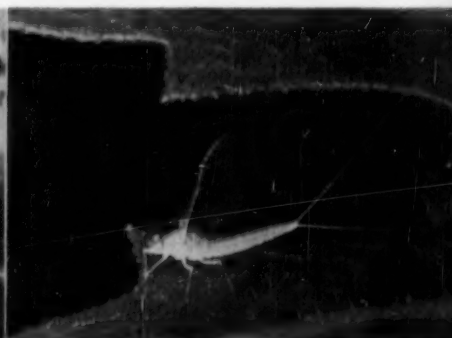
By John R. Clawson



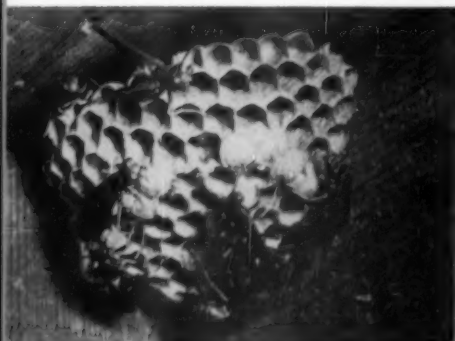
- 1 The tiny feelers used by insects to feed the mouth are called:
(a) cerci (b) antennae (c) palpi



- 2 The front feet of butterflies, as of this monarch, are equipped for walking and:
(a) tasting juices (b) digging egg holes (c) holding prey



- 3 The life span of an adult mayfly will last approximately:
(a) 1 day (b) 1 month (c) 1 year



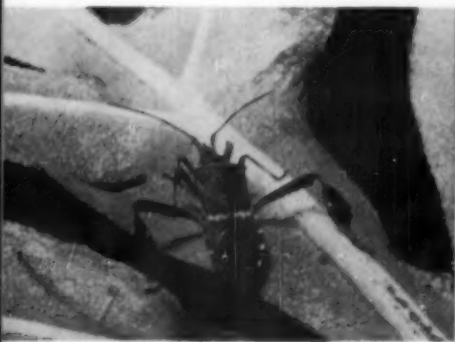
- 4 Adult wasps eat often; their favorite food is:
(a) leaves (b) insects (c) plant juices



- 5 This object, a common stage in the lives of many insects, is called:
(a) larva (b) pupa (c) nymph



- 6 The average number of young that will hatch from a praying mantis egg sac are:
(a) 2 (b) about 20 (c) about 200



- 7 Often called an "airplane bug" this *Leptoglossus* is really one of the:
(a) squash bugs (b) lightning bugs (c) dance flies



- 8 The ladybug, or lady bird beetle, got her name because of:
(a) religious connotation (b) mostly females (c) delicate coloring



- 9 Strongest of insects, beetles also boast the most species—numbering:
(a) about 375 (b) about 8,000 (c) about 250,000



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How to Attract Birds



My Summers with the Hummers

By E. Harrison Hartshorne

FOR more than a dozen years I spent my summers in a made-over sheepfold set in a meadow on the borderline between Westchester County, New York and Connecticut. A spread of honeysuckle ran across the front of it that was in constant battle with the grasses to control the slope. Whether it was from battle fatigue or old age, the honeysuckle never seemed able to produce much bloom. When I saw some ruby-throated hummingbirds trying to sip sweet nectar from the few scattered flowers of the honeysuckle, I bought brightly-colored glass feeders and half a dozen slender wooden stakes to support them. With bands of Tanglefoot flypaper to trap climbing ants, I set out the stakes at the edge of the honeysuckle, and clipped on the feeders. Then I filled them with a mixture of two parts water to one of sugar, and the hummingbirds and I were in business.

After a rainstorm, I was up at daybreak to wash and refill the feeders. Insects, flies, leaves, and ants got into the mixture, for the fluted lips of these flower-shaped feeders were large and open. When they were filled with this sort of debris, the hummers passed them with one glance, and not one sip. I found that hummingbirds were exacting customers. Meals must be served clean and fresh to them.

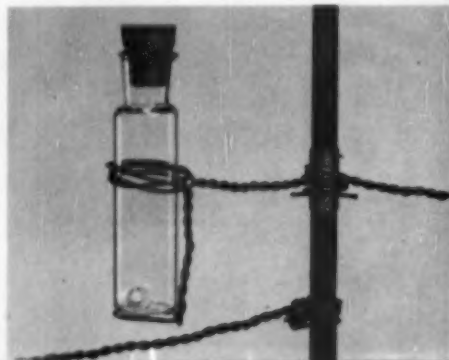
The following winter I visited the Bronx Zoo in New York City and inspected the hummingbird cages there. I found that the zoo bird-keepers used small glass bottles for feeding hummers. These held about one ounce of liquid and were so tiny at their outlets that only the long, slender bills of the hummers could sip from them satisfactorily. What a bonanza for my guests,

and what a time- and labor-saving device these were to be for myself as the provider!

I bought half a dozen of these bottles at a chemist's. The following summer, I made holders for the bottles out of wire, with a straight piece of wire alongside of each bottle for a perch. This last idea was inspired by watching a small male ruby-throated hummingbird. In the evenings, he perched in an elm tree above a feeder. Again and again he darted down and hung suspended on his whirring wings to sip his fill until darkness came upon us. I had planned to tie red ribbons around the necks of my bottles to attract their attention, but this inducement never became necessary.

One pair of hummers approached always from the east and were accustomed to feed from the three bottles at that end of my porch. Another pair seemed to like a western exposure because the bottles at that end were appropriated by them. It was astonishing to watch the feeding regularity in this division of ownership. There appeared to be an understanding and I saw few disputes over possession. Did even division of the feeders between them account for the peace that reigned? One little fe-

The "chemist bottle" feeding tube for hummingbirds, with wire holder and perch, photographed by the author.



male fed always at the most eastern bottle within three feet of my porch hammock. Her only requisite was that, when I was reading, I should delay turning my page until she had finished her feeding. She never hurried and since she sat on her perch for considerable intervals between sips, my reading was curtailed to that same extent.

The Bronx Zoo had mentioned a mixture of honey and water as a possible alternative to the sugar and water combination, but my experience indicated a distinct preference by hummingbirds for sugar and water. When bottles filled with the two different solutions were put out, it was the sugar and water mixture that was the popular one. Perhaps when hummers are free as air, they find plenty of natural sweetness like honey, so that the unnatural sugar and water combination appeals to them as a fancy dessert.*

During all my summers at the Fold, the dates for the arrival of my hummers never varied. Between May 7 and May 10, I was sure to hear the whirr of wings announcing that the ladies of the hummingbird family had come to plan their household arrangements. One seventh of May fell on a Saturday. I was at home when a female ruby-throated hummingbird breezed in and sat down immediately upon her eastern perch, as though she were in need of rest after a long voyage. She sat and sipped, and sipped, and sat for a long time, never leaving her feeder.

I shall never forget that week-end. By Sunday, male hummers had joined the ladies and then began such a day of commotion as I had never imagined. If you have not been a witness at the scene of a hummer courtship, it is difficult to believe the noise you will hear and the daring, soaring, zooming flights you will see. It is not easy to find the female hummers during these shows that their gentlemen put on for female benefit. They sit low and quietly at the performance, and they are sufficiently interested in it not to visit a feeder while the show is on. The male outdoes himself in these courtship flights. Those whirling circles that he makes in the air at this time, I have never seen, except in the courting season. The speed of the male is terrific. From a great height, he comes dashing down, twittering all the way, until I fear he will surely strike the ground before he can stop. All day that Sunday the display of the male went on. I was obliged to return to the city that evening, and so I did not know if the courtship flights went on into the next day.

For a combination of intelligence with bravery, I can think of no other tiny

bird to compare with the hummer. When I came out to replace a soiled or emptied bottle with a fresh one and happened to meet a hummer approaching to feed, it simply withdrew slightly and hung there in the air, waiting—not for me to retire—but for me to stand quietly, without movement. If one stands motionless, hummers will tolerate people remarkably close to them and go right on with their activities. I had hung up one hummingbird feeding bottle under the end of the porch where I was accustomed to eat my meals. Attached to a metal flower spray, it was a spare—not much used. One very stormy day of rain and wind, one of my hummers sipped there rather than in the open, quite uninfluenced by the presence of a baby chickadee.

The young hummingbirds were brought there and introduced to my sweet treat by their elders, but, once upon the scene, they came and went quite on their own, choosing their individual feeders to suit themselves. Plump and fluffy, they were not too hard to distinguish, and their hesitancy in settling down upon the perches beside the feeders made that proceeding delightful to watch. There was one little female that I named Miss Fluttery, because of the long and careful task of settling herself upon her perch. There was nothing timid about her, however.

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*See *Audubon Magazine*, p. 196, September-October 1955 issue, for a discussion of feeding formulas for hummingbirds.—THE EDITOR

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Season after season, the hummingbird I believe was Miss Fluttery, came and went, remaining with me until the end of September, long after my other hummingbird boarders had departed for more congenial climes. She was my most individualistic hummer, although there was also a male that distinguished himself. He preferred to perch in the long summer evenings in the tall elm just above a feeder. Lingered there, he sat and sipped for hours after his friends had departed—in fact, until I could barely see him in the deep twilight. By day, he used the perch beside the feeder. He was the only one of my hummers to sit in a tree, and then only while partaking of his late meals. My wire perches alongside the feeder-bottles were always the preferred seats of the hummers while feeding.

Their last month with me—September—was my most difficult feeding period, and theirs too, because during that time

it seemed as though the wasps and hornets gave us our toughest battle. The first part of the summer the insects were not so troublesome, but those last September days were one long struggle to keep up the sweet supply and the wasps away from the bottles. They would cluster in a mass around the bottle openings so thickly that even a hummer's sharp darting attack did not affect them. I always felt that this September competition with the wasps hastened the departure of my hummers, but one boarder remained unaffected. As I continually moved their bottles about in an effort to avoid the hornet plague, Miss Fluttery flew along with me and would even sip from the bottle in my hand as I stood quietly, searching for a fresh location. It was about the twenty-eighth of September when she, the last of my hummingbird guests that summer, took off for her winter resort. My hummer season was over.

—THE END.

IS THE RAVEN COMING BACK IN THE SOUTHEAST?—Continued from Page 171

which towers Grandfather Mountain, has shown a gradual but steady increase in opportunities to see ravens, for that great mountain has tremendous rocks, cliffs, and ledges of which the bird is so fond. Extending westward into the Great Smokies the same thing is true. Mt. Mitchell is the culminating peak of a short but

high range of the Blue Ridge known as the Black Mountains (by reason of the spruce-balsam growth) and though cliffs are not abundant there, there are enough of them to attract ravens.

The greatest factor which has favored the comeback of the raven in that whole eastern region is, in my opinion, the establishment of the Great Smoky Mountains National Park. Protection of wildlife there is absolute. Exactly the type of habitat preferred by the raven is present, and the area is, and we hope will continue to be, a source from which increasing raven populations may extend outward. Nesting sites of ravens are notoriously difficult to reach, which is another factor favorable to their increase.

However, the whole southern mountain country forms good raven habitat, and today, travelers along that great scenic motor route called the Blue Ridge Parkway (part of which, in Virginia, is known as the Skyline Drive), have excellent chances of seeing and watching ravens. Certain it is, that the sight of the big black bird does much to enhance the wild natural beauty of that spectacular region. Any reasonably good look will reveal the raven's identity. It is twice the size of a crow, and its flight is hawk-like, in that it alternately flaps and soars on horizontal wings and the conspicuously large tail is wedge-shaped.

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Never a frequent coastal species in the middle and southern Atlantic region, the raven has even appeared there in recent years. South Carolina may be taken as the area as far down in the Southeast where such records have transpired, or are likely to. Though the species is, and has been an uncommon permanent resident in the extreme northwestern corner in the mountains of South Carolina, it has been practically unknown within the Coastal Plain since colonial times. Arthur T. Wayne, the veteran ornithologist who lived near Charleston, South Carolina, all his life, never saw a raven in his 45 years in the field there. Nor have I, who, as a student of Wayne's when a young man, now almost equal my teacher's years in the field in the Low Country of Carolina. None the less, in recent years, the raven has appeared in that area. Two were seen in 1936, three in 1928, and two in 1943, one of the latter being captured with a broken wing and taken to the Charleston Zoo. The bird lived there until 1950. Not only has the raven made a very definite return to its upland haunts in the last dec-

ade, but it has appeared in areas where it had not been seen in far longer periods of time.

As this century passes its halfway mark, it seems clear that conservation endeavor has made its mark in many ways. The increased protection of wildlife and the growing knowledge of its important relation to human welfare has arisen to ward off ignorance, bias, and thoughtless destruction of animals and of their habitats.

The present status of the raven may well be taken as an indication and example of what education, and the setting aside of great national parks, may do for threatened species of wildlife. The bird-watcher of the early part of this century, who was all but denied sight of a raven in the East, today has an excellent chance of thrilling to the observation of the black dweller of the mountain crags, and even in the lower levels. There are many who look for it today as they come southward over highways through the high country. Certainly, there is vivid contrast in the witnessing of its occurrence now to that of the day when Matthew Lewis wrote his sea-faring ballad "Bill Jones":—

Ah, well-a-day, the sailor said,
Some danger must impend,
Three ravens sit in yonder glade
And evil will happen, I'm sore afraid
'Ere we reach our journey's end.

And what have the ravens with us
to do?

Does their sight betoken us evil?
To see one raven 'tis luck, its true,
But its certain misfortune to light
upon two,

And meeting with *three* is the devil.

Anyone today "meeting with three," soaring majestically over the peaks of the Great Smokies, or over a wide valley stretching away from the slopes of Mt. Mitchell or Grandfather Mountain, would be far from thinking of such encounter as anything but a red-letter day, much less "the devil"! More power to it, and may its numbers increase.—THE END.

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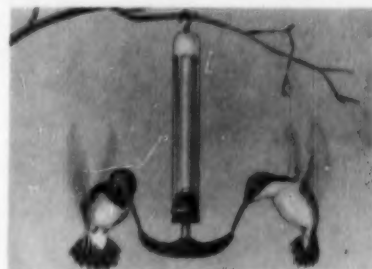
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BOOK



Notes

By Monica de la Salle

Librarian, Audubon House

KINSHIPS OF ANIMALS AND MAN: A TEXTBOOK OF ANIMAL BIOLOGY

By Ann H. Morgan, McGraw-Hill, New York, 1955. 9 1/4 x 6 1/4 in., Illustrated. Indexed. \$6.75.

"It is not that its substances are so unusual, it is the way they are put together"—so writes Miss Morgan, the author of the well-known field books on ponds and streams and on animals in winter, concerning the nature of living matter. Her statement might apply equally well to this unusually fine textbook which happily blends a vast amount of information with an interesting style. The stress on ecology is particularly notable.

OUR AMERICAN WEATHER

By George H. T. Kimble, McGraw-Hill, N. Y., 1955. 8 1/4 x 5 3/4 in., 322 pp. Illustrated. Indexed. \$4.75.

Fantasy-minded individuals are charmed when the weatherman is not always right, while pessimists stop gloating when he is not always wrong. No doubt we would excuse any man who fails to forecast a prima donna's moods, and so let us be indulgent when a hurricane comes up instead of the announced "gentle and variable winds." For the author, an outstanding meteorologist and geologist, warns us that "there is nothing quite like American weather anywhere in the world." Such individuality has its drawbacks for planning a week-end, but also paves the way for optimism behind any dark cloud. Appropriately the first of the 12 chapters (January to December) opens with a discussion of "unseasonable weather" and why it occurs. From there on there is a veritable snowdrift of information, sparkled throughout with gentle humor.

A LABORATORY AND FIELD MANUAL OF ORNITHOLOGY

By Olin Sewall Pettingill, Jr., Burgess Publishing Co., Minneapolis, Minnesota, 3rd ed. revised, 1956. 11 1/2 x 8 3/4 in., 379 pp. Illustrated. Indexed. \$5.00.

This revised and greatly enlarged edition of Dr. Pettingill's "Manual" is

most welcome. Anatomy, physiology, biology, classification, distribution, migration, identification, ecology, populations, habits, etc., are treated in detail, and suggestions for special studies on each subject are outlined. Up-to-date, extensive bibliographies, both general and specialized, give this volume the scope of a reference book of primary importance. The black and white drawings by Walter J. Breckenridge are charming. Amateurs and specialists alike will find here a wealth of information and guidance to their studies, as well as the latest theories advanced by ornithologists.

NEW ZEALAND BIRDS

By W. R. B. Oliver, A. H. & A. W. Reed, Wellington, New Zealand, 1955. 10 1/4 x 7 1/2 in., 661 pp. Illustrated. Indexed. £6 (about \$17.00).

Islands are always of great interest to ornithologists and conservationists. When their geographical location permits, primitive conditions remain unchanged there for considerable periods of time; true "oceanic islands" (i.e., very remote from land) originally had no mammals (except bats), no amphibians, and no snakes. With few or no predators, some birds become flightless, and most are fearless. The arrival of man, however, disrupts the fragile balance within these Edens. Not only does man introduce species of plants and animals that compete, with tremendous success, with the original fauna and flora, but further disturbance is brought by building and agriculture on large areas, thus changing the original habitats. Hunting and collecting contribute to the decimation of vulnerable or "eatable" species. All these factors have played their part in New Zealand, brought about, first, by Maoris, and later, by Europeans. The moas are one example of the extinction of many strange or spectacular birds. Many species are gravely threatened today. A new edition, revised and enlarged, of Mr. Oliver's classic work is most welcome. Detailed descriptions of birds are given, as well as status (including history of

the discovery of New Zealand species), distribution, habits, voice, nesting, food, ecology, etc., and short bibliographies. Numerous photographs, some in color, illustrate a text covering all the birds of New Zealand, extinct, living, and introduced.

STUDIES OF THE PSYCHOLOGY AND BEHAVIOR OF CAPTIVE ANIMALS IN ZOOS AND CIRCUSES

By H. Hediger, translated by Geoffrey Sircom, Criterion Books, N. Y., 1955. 10 x 6 in., 166 pp. Illustrated. Indexed. \$6.50.

In an earlier book* the author considered the habits of animals in their normal habitat and what adaptations could be made to provide for successful captivity. Discussing territorial requirements, range, food, sociological, physical, and biological environment in the wild, it was an excellent background and introduction to the present study. Dr. Hediger has been director of zoological gardens in Switzerland for many years. He has also been on research expeditions to Africa and is professor of animal psychology and biology at the University of Zurich. With such a background, it is not surprising that his opinions should be of unusual interest. It is impossible to give here even a summary of the contents of this highly readable and thought-provoking book. Facts and anecdotes on the behavior of wild and captive animals in their daily life, in solitude and in relation to their own and other species and to man, in breeding, play, and the process of training, fill every page. Dr. Hediger feels that, taken separately, each of the three methods of studying animals (in the laboratory, in captivity, and in the wild) is misleading and incomplete, either because the conditions are abnormal or because only part of the animal's activities can be observed. It is only by combining and comparing these methods that we can have a true psychological picture. Going further, he suggests that just as comparative anatomy is one of the first courses required for medical students, so should comparative psychology be necessary for psychologists. As he puts it, "How much do we see in the animal that is human—all too human—and how often do we regard the actions of *homo sapiens* as animal-like." It must be added, however, that he is strongly against a merely anthropomorphic interpretation of animal behavior.

* "Wild Animals in Captivity," Academy Press, N. Y., 1950.

BEAUTY IN NATURE

By V. J. Stanek [translated by Jean Layton], Artia, Prague, Czechoslovakia, 1955. 12 1/2 x 9 1/2 in., 370 pp. Illustrated.

Indexed. £2.10 (about \$7.00). (Available from Francis Edwards, Ltd., 83 Marylebone High Street, London, W. 1, England.)

This is one of the most beautiful books of nature photography that we have seen in a long time. Most of the plates are in black and white, but the "soft" sharpness of the reproduction process gives each one the value of a portrait. The subject matter covers a wide range, from diatoms and snowflakes to snails and leopards, and including flowers, birds, insects, fishes, and landscapes. Captions and text briefly explain the pictures.

A SOURCE-BOOK OF BIOLOGICAL NAMES AND TERMS

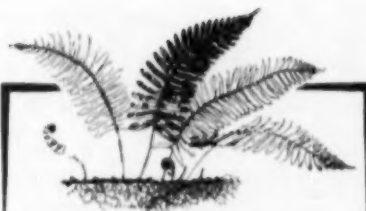
By Edmund C. Jaeger, 3rd ed. [enlarged], Charles C. Thomas, Springfield, Illinois, 1955. 10 x 6 1/2 in., 317 pp. Illustrated. \$6.25.

Like a good wine, this excellent reference book improves with age—or at any rate with each new edition. Here are listed alphabetically thousands of etymological roots from which biological names and terms are derived. The introduction explains how words are built, the types of names considered, the trans-literation from the Greek to Latin and English, and the form of Latin nouns and adjectives. The appendix gives brief biographies of men in whose honor commemorative scientific names have been given.

FROM BLOSSOM TIME TO AUTUMN FROST

By Istvan Homoki-Nagy, Corvina Publishing House, Vaci-Utca 12, Budapest, V, Hungary, 1955. 11 1/4 x 8 1/4 in., 91 pp., 191 plates. (About \$4.50)

The author of this book is a nature photographer and film director. Here he gives details on techniques of observation and camera positions for close-



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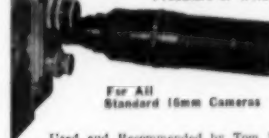
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ups, as well as information on how nature films are shot for action sequences. Many interesting details on Hungary's wildlife are included. The numerous photographs (a majority in black and white, but many are in color) are lovely, and photographic data is given with each.

OHIO'S WILDLIFE RESOURCES

By Rod Cochran, Division of Wildlife, Ohio Department of Natural Resources,

MOTHS OF THE ARC

Continued from Page 169

erly. One tearful, sixth-grader I know explained this, too late, to his mother who, with the best intentions and some courage, had maneuvered the queer animal into a small cage.

Male cecropias fly great distances to court the females. Time is short for the females. On their first nuptial night, or the next one, they must deposit eggs on the leaves of certain kinds of "host" trees. Cecropias choose maple, wild cherry, willow, grape, and gooseberry, information valuable to boys who raise their caterpillar larvae. In about 10 days, a tiny green caterpillar hatches from each egg and begins to devour the leaf. After several weeks of eating many leaves, it has become three inches long and colored beautifully in the eyes of humans who can overcome their aversion to "worms." At this point, it spins a cocoon and the cycle is repeated. The life history of the other silkworm moths is very similar. Of these, the luna is especially striking and photogenic, a pale-green beauty with a long streamer on each hind wing. A delightful and plausible theory is that luna moths inspired the reports on which the belief in fairies is founded.*

Winged silkworms were the prize of boyish collectors but certain others rated high. The various hawk moths, large-bodied and narrow-winged, greatly resembled hummingbirds in size, shape, and feeding habits. They are well equipped with a feeding apparatus—a two-inch hollow tongue, which, when not in use was coiled up like a watch spring. The tomato hawkmoth, the winged stage of the big green tomato worm, was the commonest of the family.

* See "Out of the Soft, Black Night", by William Byron Mowery *Audubon Magazine*, Sept.-Oct., 1952, p. 315.

Columbus, 1955. 12 x 9 in., 210 pp. Illustrated. No index. Paper-covers, \$1.00.

This attractive volume should serve as a model for publications of its kind. Written for the purpose of answering the questions most frequently asked of the Ohio Department of Natural Resources, it is not only informative but eminently readable. One third of the book covers the most common families of birds and mammals occurring in

Another group, less readily attracted to lights, was the underwing moths. Their fore wings, the ones which are uppermost when the moth is at rest, were dull-colored, like bark. But, when the insect moved and the hind wings were exposed, zones of bright color showed. The effect was quite startling—something like that of a demure Victorian lady who had shown a flashy petticoat.

Arc-light hunting may have seemed as simple as "shooting fish in a barrel" but it presented certain problems and even a hazard. The insects swirled at dizzy speeds in irregular orbits about the light which was suspended at least 20 feet above the net of the tallest boy. Just when a certain desirable insect would leave its orbit was unpredictable. Even if its path were within netting range, it would be capturable only during a split second of its flight. Our constant alertness and coordination were required.

One of us, a promising baseball player, maneuvered his special short-handled net superbly. He was capable, at times, even of catching the bats, which pursued insects into the circle of light. In retrospect, it seems likely that he swung from the rear where the bat's "sonar" may be inoperative. Even with coaching, I never mastered the trick, but I had a specialty of my own—handling live spiders barehanded.

The young bat-netter achieved some glory on the baseball diamond a decade later. The spider handler has not made anything of his talent so far, but he has plans. As soon as he has acquired a million dollars, he will retire, buy a truck, and equip it with a special electric generator. Somewhere, he will buy an old arc light and mount it on the truck. At last, he will be ready to go moth hunting in the dark wild places where large beautiful moths still flutter through the night.—THE END.

Ohio, giving their economic status, management, and life histories. They are classified by their habitats of farms, forests, wetlands, lakes, ponds, and streams, with short sections on fish baits and on wildlife management and administration. One third consists of colored plates with excellent captions. The appendix includes complete checklists of Ohio's fishes, amphibians, reptiles, birds, and mammals (with scientific names and data on distribution and abundance), maps, charts, instructions for constructing bird-houses, and a short list of references for additional reading. It hardly need be stated that conservation is emphasized.

ELEMENTS OF ECOLOGY

By George L. Clarke, John Wiley & Sons, N. Y., Chapman & Hall, London, England, 1954. 9¼ x 6 in., 534 pp. Illustrated, Indexed. \$7.50.

This textbook, following the current trend, deals with both plants and animals. Because of the author's background a large number of the examples given deal with aquatic organisms, though terrestrial species are also treated. Logically organized from the simple to the more complex aspects of ecology, chapters will be found on "The Medium" (immediate environment of air or water), "The Substratum" (surface on which an organism lives), and on water, temperature, light, air, food, relations within and between species, and the community. Of special interest are the chapters on ecological succession, cycles, and dynamics.

WATER: THE YEARBOOK OF AGRICULTURE, 1955

Superintendent of Documents, Government Printing Office, Washington 25, D. C. 9¼ x 6 in., 751 pp. Illustrated. Indexed. \$2.00.

"Nearly everyone in this country... has experienced some problem caused by too much water when we do not want it or too little water when we do want it." This book, published by the U.S. Department of Agriculture, stresses the need for conservation and treats of the various aspects of water supply in relation to soil, forests, crops, wildlife, etc., as well as giving information on the causes of erosion, floods, and drought, and what should be done for their prevention and control.

A WOMAN IN THE POLAR NIGHT

By Christiane Ritter, translated from the German by Jane Degras, E. P. Dutton and Company, New York, 1954. 8¼ x 5¼ in., 223 pp. \$3.00.

At whatever time of the year the reader living in a more temperate zone picks up this book, he is likely to prefer his own climatic lot. On Spitzbergen, five

months of the year are perpetual night, perpetual ice and snow, with frequent storms that sometimes rage for two weeks. Summer months are perpetual daylight, perpetual mists, and drenching rain. Endless stones and boulders shape the horizon. Nevertheless, men do live there and the call to this bleak wilderness is so strong that they have been known to fake their ages in order to secure a permit to stay there past the age of 70. The author left her native Austria to spend a whole year there with her husband. A more depressed lady than Mrs. Ritter—when she first saw the primitive hut in which she was to spend so many months—would be difficult to imagine. Her reluctance to leave the place, however, demonstrates that some basic human need had been fulfilled during her stay. Other housewives might feel that to have to choose between walls covered with soot or with hoarfrost would be like standing between the devil and the deep sea; but not Mrs. Ritter. As the nearest settlement was 150 miles away, she had a fine sense of freedom from civilization. When on short occasions the sun or moon glittered on the snow, the beauty of the fairy-like mirages had no parallel. Perhaps such an adventure is the way to find the real meaning of life. Such was the author's case, and it is an experience she shares with the reader.

HOW TO MAKE CUT FLOWERS LAST

By Victoria R. Kasperski, M. Barrows, N. Y., 1956. 8¼ x 5½ in., 191 pp. Illustrated. Indexed. \$2.95.

Arranged in alphabetical order, some 300 flowers (mostly cultivated, though some wildflowers are mentioned), as well as fruits and foliage, are treated in this book. Information as to the longest time they can be successfully kept is given, followed by instructions on when and how to gather them, and how to condition them to make them last. A chapter is devoted to the treatment of special groups, such as those with woody or hollow stems, and to such matters as the treatment of show flowers, equipment for arrangements, and chemical preservatives.

FIRST AID AND CARE OF SMALL ANIMALS

By Ernest P. Walker, *Animal Welfare Institute*, 350 Fifth Avenue, New York, 1955. 10 x 7½ in., 46 pp. Illustrated. Indexed. Paper, 25¢.

Some youngsters—and a few kind-hearted adults as well—have a faculty for finding lost or injured animals and bringing them home, where problems of housing and feeding arise. This booklet will answer many an anguished question. Advice on practically every animal

— from alligators to cockroaches — is given; instructions that will keep both hosts and guests happy until the latter can fare for themselves.

ANSWERS TO INSECT QUIZ

Continued from Page 179

1. (c) palpi
2. (a) tasting juices*
3. (a) 1 day
4. (c) plant juices**
5. (b) pupa
6. (c) about 200
7. (a) squash bugs
8. (a) religious connotation***
9. (c) about 250,000

* Tasting juices is correct here. Many moths and butterflies apparently taste sap or plant juices with their feet. Experiments by this author, however, seem to indicate that there is another (but closely allied) reason. The act may be performed to test for small obstructions in the juice—that if taken would clog the delicate drinking tube, i.e., fruit juices containing large grains of sugar are refused, but syrup or thoroughly boiled sugar water is an acceptable addition to the juice.

** Wasps are, perhaps one of the most valuable animals in the control of insect pests. However, the adult wasp lives on sap and juices. When a wasp captures an insect, it is masticated and fed to the baby wasp, or larva. So immature wasps eat the insects—captured by the sap-loving adults.

*** There is a legend that Italian farmers in the Middle Ages recognized the aphid-control performed by these little beetles and dedicated it to The Virgin Mary. Hence it was called "The Beetle of Our Lady." Later, this became ladybird beetle, or lady bug.

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Children's Books

By Dorothy Edwards Shuttlesworth



RECENTLY anthropologist Margaret Mead, in comparing primitive peoples to the civilized, made an interesting point about friendship. Friendship, she stated, was definitely a "product" of civilization. In primitive societies a person associates only with his relatives; there is no place in the scheme of things for a friend.

Somehow this connected in our thoughts with facts we have been absorbing on world illiteracy: that 95 per cent of the colored people in Africa do not know the meaning of the printed word and almost the same percentage is true of the Indians of Latin America. And these are just two of a number of areas where a book would be incomprehensible. In the United States we hear so much about the best method for "teaching Johnny to read" that we often overlook the wonderful fact that most of our Johnnies and Marys do learn.

Gradually, some of the primitive peoples are being helped to put on paper the sounds they make in speaking, and then to recognize these symbols when someone else writes them. With this first step toward reading, a "primitive" begins to be capable of taking his place in the modern world—to learn what industry is all about, to become acquainted with the various governments which in one way or another are trying to shape his destiny. He will read about these things and eventually, it is to be hoped, he will read for enjoyment and his children will have the same delightful reading experiences our boys and girls have today. By then the primitive societies of which Margaret Mead speaks should have made the discovery of friendship, and, if they are truly "civilized," will be counting good books among their best friends.

Numerals after titles indicate age groups

MARK TRAIL'S BOOK OF NORTH AMERICAN MAMMALS (all ages)
By Ed Dodd, Hawthorn Books, New York, N. Y., 1955. 6¼ x 4¼ in., 242 pp. Illustrated by the author. \$1.75.

Here is an uncommonly fine blend of the kind of material we look for in a science book and the type of newspaper "comic" strip presentation that children find so irresistible. Each page is frankly a picture page; the mammals depicted are shown in action as they might be seen in their natural surroundings, and information is given in brief caption form. However, since several pages are devoted to each animal, the captions add up to a comprehensive story. The volume is pocket-sized so that it may easily be used as a field guide; but it is a fine book also for those who do not have opportunities for exploring. The lively true-to-life pictures seem to take young readers out into forest and field. Ed Dodd's daily newspaper strip and Sunday page on nature subjects, camping, hunting, and fishing have been widely known for years. This collection of mammal subjects is the first to be brought together in a book.

QUEST OF THE SNOW LEOPARD (13 and up)
By Roy Chapman Andrews, The Viking Press, New York, 1955. 8¾ x 5¾ in., 190 pp. Illustrated by Kurt Wiese. \$2.75.

Dr. Andrews is indeed a man of many talents. After long distinguishing himself as explorer and scientist, he is proving he can write fiction with the best of them. In this, his newest book, he tells the adventures of "Ken Lewis," a 16-year-old boy who has the exciting opportunity of joining a museum's collecting expedition in southwest China and to the Tibetan frontier. Today such a trip would, of course, be impossible, but the story opens in 1916 and it is based on an actual zoological expedition which Dr. Andrews made to China in that year. Most of the adventures actually happened to him or to some of his friends; the facts about the country and its people and animals are true; and considerable information is given about how expeditions are run and how girls and boys can prepare themselves for expedition work. But all this "authenticity" does not slow down the story. It is swift-moving and dramatic, the stuff adventure-loving teen-agers thrive on.

THE WORLD OF PLANT LIFE (10 to adult)
By Clarence J. Hylander, The Macmillan Company, New York, 1956. 9½ x 7 in., 653 pp. Illustrated with photographs and drawings. \$8.95.

Many a parent will remember 17 years ago when, as a high school or college student of botany, he discovered a new book that answered his fondest dreams of a comprehensive, authoritative reference book that was written wholly for the layman. The book was Dr. Hylander's "The World of Plant Life," of which a revised, up-to-date edition has now been published. Decidedly, it is not a child's book, but its 190 full-page photographs and hundreds of line drawings will be very likely to tempt young children to explore its pages; and as a youngster advances in school he will find it an invaluable aid in science work. Practically every plant that is common in America is included in text and pictures; and besides being a guide to plant identification, it is a storehouse of information on such matters as the origin of cultivated plants and the relationship of plants to each other.

A TREE IS NICE (4-8)
By Janice May Udry, Harper and Brothers, New York, 1956. 11½ x 6½ in., 32 pp. Illustrations by Marc Simont. \$2.50.

No statement could be more simplified than this title, and its very simplicity makes it arresting. It is probably one of the first comments many a child makes about the complex and marvelous creation that we know as a tree. From the title the young reader can go on to reasons—some funny, some important—why trees are so good to have around. The illustrations by Marc Simont (half of which are in full color) are completely right for carrying out the youthful charm of the words. A child would undoubtedly say they were "nice."

NATURE GAMES AND ACTIVITIES (all ages)
By Sylvia Cassell, Harper and Brothers, New York, 1956. 8¾ x 6¼ in., 91 pp. Illustrated by Peter Burchard. \$2.50.

Any mother who leafs through this attractive book is likely to find thoughts of her next child's birthday party coming into focus. In it there is many an original idea for games and activities which should delight a group of girls and boys, as well as suggestions for hobbies that a child may like to pursue over a period of time. Miss Cassell is an active worker with Girl Scouts, and her ability to interest and intrigue young people is clearly evident in her plans and writing. Scout and Camp Fire leaders should find "Nature Games and Activities" a treasure-trove. It is regrettable that the chapter head for activities dealing with insects should help perpetuate the error of calling insects "bugs," but this is not repeated in the text.

ZIGGER, THE PET CHAMELEON (6-9)

By Genevieve Gullahorn, *Abelard-Schuman, New York*, 1956. 8 $\frac{3}{4}$ x 6 $\frac{1}{4}$ in., 62 pp. Illustrated by George F. Mason. \$2.50.

This pleasant tale, which begins with a day at the circus at which Eddie and Jan become the proud owners of an "American chameleon," gives much helpful advice about the proper care of this popular type of pet. Zigger, with his comical personality and roving ways gives his adopted family a lively time; he is also the cause of their learning the truth about color changes in chameleons. Since considerable information is included in the story it would have been interesting to note the fact that the so-called American chameleon, usually sold at circuses, is a lizard, differing from the true chameleon of the Old World but sharing its ability to change color. The illustrations by George F. Mason bring Zigger delightfully to life.

BERRIES IN THE SCOOP (7-9)

By Lois Lenski, *J. B. Lippincott Company, Philadelphia and New York*, 1956. 8 $\frac{1}{4}$ x 5 $\frac{3}{4}$ in., 124 pp. Illustrated by the author. \$2.25.

Cranberries are an American heritage, but just how they grow is not widely

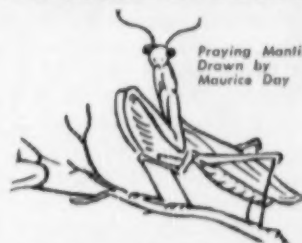
known. In this story by Miss Lenski we meet a most likable group of people who make their living in the cranberry bogs of Cape Cod. In the course of their adventures we learn how cranberries are grown and gathered, and see them at work and play enjoying picnics and harvest celebrations. "Berries in the Scoop" is one of a series of books (each a unit in itself) which shows the way children live and work in various sections of our country.

WILD LIKE THE FOXES (9-13)

By Anauta, *The John Day Company, New York*, 1956. 8 $\frac{1}{4}$ x 5 $\frac{1}{2}$ in., 192 pp. \$2.50.

Alea, an Eskimo girl whose mother died when she was only 10, had problems to contend with as she hunted, trapped, and otherwise lived a boy's rugged life on the Labrador peninsula. But these were trivial compared to those she faced when she was sent to England to be "educated." This is a fascinating story of two contrasting ways of life; it is especially interesting because it is based on the actual girlhood of the mother of the author. Anauta spent her own childhood with her Eskimo family but later came to the United States where she became a lecturer and writer in this totally different civilization.

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viceroys butterflies on these flowers and the harmonious color relationship appealed strongly to me. One day I found one so unafraid of my nearness that it posed for its portrait. At another time, one perched on my bare arm, moving from place to place, evidently enjoying the salty flavor of my skin.

In some of the moist places, the pink spires of the steeple bush, *Spiraea tomentosa*, rise above the tall marsh grasses. These flower spikes bloom from top to bottom, resulting in flower color ranging from the light brown of the withered flowers at the top through shades of pink to the deepest color of the opening buds at the bottom. Its near relative, meadow sweet, *Spiraea latifolia*, flaunts its fleecy pink and white flowers nearby. However, it belies its name, for they are without fragrance. The triangular spike is composed of many tiny flowers. A rare treat awaits those who view them through a magnifying glass, for they resemble small apple blossoms.

Some black-eyed susans, *Rudbeckia hirta*, will be found there, growing in company with the sneezeweeds of an entirely different family but of similar appearance. The orange and black, black-eyed susan, unlike the white daisy, which is an immigrant from Europe, is a native of our western prairies and has worked its way all over the East and South. It is a most decorative flower, beloved by old people and young alike.

Sneezeweed, *Helenium nudiflorum*, gets its name from the fact that certain persons are affected by its pollen which causes them to sneeze. In this meadow, one can see the cardinal flower, *Lobelia cardinalis*—the purest red in nature—from some distance away as its handsome color strikes the eye. Its vivid beauty and prominence make it suffer from wanton picking, as it does not hide in the tall grass like the closed or bottle gentian, *Gentiana andrewsii*.

The closed gentian is shown much attention by the bumblebee which, after quite a struggle, manages to force its way into the flower in his search of its nectar.

Nearby, in the marshgrass, purple-fringed orchis, *Habenaria pycnodes*, fills the air with its delightful fragrance. Its grace and beauty proclaim its relation to those aristocratic coun-

ins, the orchids of the florist's shop. If we are lucky, we might also find there at this time a smaller species, the white-fringed orchis, *Habenaria blephariglottis*, equally fragrant and beautiful of form.

Some swamp milkweeds, *Asclepias incarnata*, are still blooming in this August meadow, although earlier blossoms have developed into erect green pods. The dull crimson flowers have a pleasing perfume and are most attractive to the bees.

Somewhat later, turtleheads, *Chelone glabra*, will flower. These cream-white blossoms are well named because they do resemble a turtle's head, but their structure makes access to their nectar quite difficult for the bees.

Although generally considered a September flower, there are a few early blooming species of the goldenrods which are beginning to show color. These truly native American flowers are represented by many species, some quite rare. Like many of our native plants, some of which the farmer despises, goldenrods are cultivated in England as a garden flower. With the asters, there are many species, which will take over the wet meadow in September.

Under favorable conditions, purple loosestrife, *Lythrum salicaria*, which covers the marshes along the Hudson River during August, has a long period of bloom here. Deep

down in the tall grass, the yellow-flowered fringed loosestrife, *Lysimachia (Steironema) ciliata*, struggles in its constricted quarters for a place in the sun. Growing with it is a lovely smaller plant, the marsh St. Johnswort, *Hypericum virginicum*, whose tiny, flesh-pink flowers are so beautiful.

Just above the wettest parts of the meadow, where the dry ground begins, there stands a large patch of wild bergamot, *Monarda fistulosa*, still in bloom. This purple flower is closely related to the striking red bee-balm. The bees are very fond of visiting these blossoms.

At the edge of the brook grow several other small flowers, insignificant at first glance, but after closer inspection, quite beautiful and important. One of these is the blue monkey flower, *Mimulus ringens*, named for its likeness to a grimacing simian. The plant is about two feet high and bears many blossoms.

Also at the edge of the brook with one "foot" in the water and the other on dry land grows the amphibious arrowhead, *Sagittaria latifolia*. Its pure white flowers, always in threes, with their golden stamens and the equally decorative arrow-shaped leaves, are very attractive. Where the brook widens into a pool, there are a few spikes of pickerel weed, *Pontederia cordata*. These lovely blue flowers, however, seem to find the edges of the pond and lake more to their liking. The height of bloom now prevails in the wet meadow. If you would enjoy this feast of exciting floral treasures, do not delay to explore its offerings.

A week later, the glories are dimmed by the inevitable progression of the season. The purple orchis has faded to an almost unrecognizable spike, the swamp milkweed is all erect seed pods. Joe-Pyeweed's raspberry is much paler, but the white flowers of its cousin the bone-set, *Eupatorium perfoliatum*, are at their prime. The delicate pink blossoms of marsh St. Johnswort have disappeared, the fringed loosestrife is but a memory, and the cardinal flower is opening its last flowers.

Five weeks later when the wet meadow has become a mass of brown and withered foliage, the blue eyes of the fringed gentian will open in the sunshine and grace the meadow. It is the last flower of the year.

—THE END

ABOUT THE AUTHOR

Samuel H. Gottscho, Jamaica, Long Island, New York, is the senior partner of Gottscho-Schleisner, professional photographers. He has been taking photographs since 1896. Mr. Gottscho says that the most important day in the 80 years of his life was May 18, 1925 when he made his debut as a full-time professional photographer. The files of Mr. Gottscho, and his partner and son-in-law, William H. Schleisner, contain more than 60,000 negatives. Many of their photographs of gardens, flowers, and home architecture have appeared in *House Beautiful*, *House and Garden*, *Country Life*, *Better Homes and Gardens*, and other publications. Mr. Gottscho is the author of "Wild Flowers, How to Know and Enjoy Them." He is currently at work on a book, "My Life in Photography."—The Editor

Your CHILDREN

By Shirley Miller

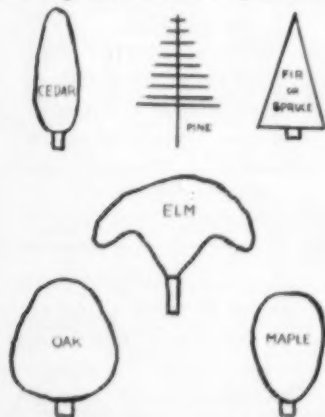
With some two months to go until school bells start ringing again, your children may be getting a little bored with all those vacation activities that they yearned for so last May. They have probably found that sunburn and nettles aren't much fun. Now that they've mastered a jack-knife dive and rowing in a straight line, they will be looking for new worlds to conquer. Well-planned explorations of the world around them could very well stave off that vacation anti-climax that they will be headed for by August. And whether they explore their backyard, the countryside, a city park or a city street, you'll find that the interest this will generate will keep them out of both your hair and the icebox until well after Labor Day.

For the August Doldrums

One way to plan a lively exploring trip is to organize your group as a **LIVING NOTEBOOK**. Instead of writing down all the fascinating things they see (a scarlet tanager, a garter snake, the first red leaf on a vine maple, or a flock of sandpipers) the first child to see it *becomes that object*. He observes it carefully so he can describe it accurately. Whenever you like (during the trip or afterward) you can "read" your notebook. At this time each child gives clues to what he represents (acting it out in the case of a living object). The others then guess what he is. In a small group each child may represent several objects. You can use this technique for many kinds of trips—for instance:

Tree Sighting

Many trees have distinctive shapes. Like airplane silhouettes, you can dis-



tinguish them as far as you can see them. Children can learn to recognize these shapes at a glance. Use the **LIVING**

NOTEBOOK idea for your Tree Sighting trips, and have each child "become" the tree he first identifies. In this case he learns all he can about his tree in order to tell about it at the time that you "read" your tree notebook. You can include **TREE SKETCHING** in this project, too. It's easy if you start by using basic outlines, such as are illustrated on this page, and by gradually adapting these to individual trees.

Exploring Your City Block

City-dwellers can have excellent trips, too. **EXPLORING YOUR CITY BLOCK** offers a good chance to have a **LIVING NOTEBOOK**. Start with the sky. From a good vantage point sketch the skyline to the east or west and each week record the sun's position as it rises or sets. This plots the progress of the earth around the sun. The record is astonishing! Now examine the street, sidewalk, and buildings. You'll discover granite, limestone, sandstone, asphalt, wood, and man-made bricks, concrete, tile, and glass. Trace the source of these and you'll go around the world and backward in time millions of years. Shops are natural-history treasure houses. Investigate your grocery, with its vegetables, spices, cereals; the florists; and a clothing store, with its cotton, linen, wool, and silk. Concentrate on a **SUPER MARKET** for one fascinating trip.

After you have "read" your City Block Notebook, make word scrambles of the items you found. Divide these into "animal," "vegetable," and "mineral" categories for further interest. Who can unscramble them first?

Animal Tracks

These are easy to find in the summer, on wet sand or mud, but if you have trouble, here's a tip: prepare a basket of



food—apples, carrots, nuts, bread with peanut butter, meat or suet, and dried corn. In the evening place this on a smooth area of wet sand or mud near the haunt of birds or other wild creatures. Leave it overnight. The next morning you're pretty sure to find fresh tracks of the wild friends who came to this picnic. Make a **PLASTER CAST** of their tracks. Stand a cardboard collar around the track. Mix Plaster of Paris with water until thin enough to pour, and fill the track. An inch of plaster makes a good cast. Allow this to stand for 15 minutes; then pick it up and wrap carefully in a newspaper to prevent rubbing while still damp. When it is dry, brush off the dirt and you have a negative or raised cast of the track.



You can practice getting good animal impressions for tracks and then making casts by having your cat or dog walk across a shallow box of wet sand (see illustration).

RE-FUELING

For a considerable length of time Bobby Jo watched robins in their eager search for worms brought close to the surface by heavy rains. Finding a particularly productive spot, the birds remained in one small area until Bobby Jo turned a puzzled face and asked, "Grandma, why do the birds stay in one place and not fly away?"

"Oh, I guess they're hungry," Grandma replied, and went about her work. Bobby Jo watched a while longer, still troubled at their behavior. Then she figured it out to her satisfaction and knew the answer.

"Grandma," she said, "I know what's the matter with the birds. They're out of gas."

—FAY MARY FIELD

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